

City of Oklahoma City
Preliminary Report
PC-0701 and PC-0729

Street Enhancement
From N. Classen Boulevard, W. Sheridan to NW 10th Street

Prepared by:
KIMLEY-HORN & ASSOCIATES INC.
14101 Wireless Way Building A Suite 150
Oklahoma City, OK 73134
(405) 241-5425



Lydia Leslie, P.E., CFM

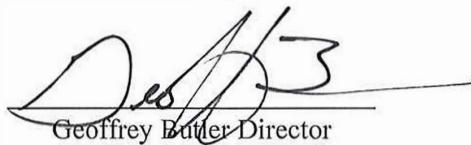


Recommended for Approval



Eric J. Wenger, P.E. Director

Public Works/City Engineer

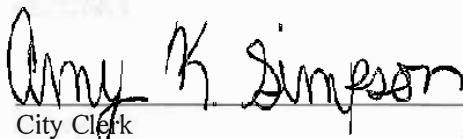


Geoffrey Butler Director

Planning Department

APPROVED by the Council of the City of Oklahoma City this 16th day of August, 2022.

ATTEST:


City Clerk




Mayor



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- Appendix C: Drainage Report and Calculations

1.0 Executive Summary

Classen Boulevard has long been an important part of Oklahoma City. It was originally constructed as a corridor to connect a local neighborhood to the downtown area. It also was the location of one of the first streetcar projects in Oklahoma City. Over the years the corridor has been modified and it remains a vital connection.

Classen Boulevard between N. Sheridan and NW 10th Street is a six-lane divided boulevard that functions as a main thoroughfare for the west side of downtown Oklahoma City. The nearby residents and the City officials desire to make the boulevard more conducive to all modes of transportation.

1.1 Project Scope

The project scope includes reducing the vehicle lanes from six lanes to four lanes making a tier one bicycle facility in each direction. The project scope also includes adding an appropriate sidewalk ADA path along both sides of the roadway as well as upgrading the pedestrian traffic facilities and radar detection for the bicycle facilities. The bicycle facilities will be designed to go behind the proposed bus pads for the current transit route. The bus pad areas are also designed with future expansion capabilities. Asphalt milling and overlaying through the corridor and repair of storm sewer at NW 9th and Classen are also included in the base scope of work. Lighting in the center median will be upgraded with new poles and LED lighting along with the modifications to the center median. An existing channelized turn lane at Main Street and Classen Boulevard will also be included in the base bid.

1.2 Schedule

Once the preliminary plans have been approved, the project will begin Final Plan tasks and the NEPA Environmental process with ODOT can begin. The NEPA Environmental process can run simultaneously with the other submittals and will take approximately 10 months. The submittal of 60% and 90% plans will be completed in approximately 6 months which includes the submittals, reviews, and responses to the comments. The ODOT letting process will take approximately 3 months and the bidding 2 months. ODOT also allows a 3 month flex start which is also taken into the schedule. Construction will commence following the bidding and is estimated to take 1 year. The anticipated completion time is Late Summer 2024.

	May-22	July-22	July-22	Aug-22	Sep-22	Oct-22	Nov-22	Dec-22	Jan-23	Feb-23	Mar-23	Apr-23	May-23	June-23	July-23	Aug-23	Sep-23	Oct-23	Nov-23	Dec-23	Jan-24	Feb-24	Mar-24	Apr-24	May-24	June-24	July-24	Aug-24
Acceptance of Preliminary Report																												
NEPA Environmental																												
60% Submittal, Review and Respond to Comments																												
90% Submittal, Review and Respond to Comments																												
Letting																												
Bidding																												
Flex Start																												
Construction																												

1.3 Budget

The fixed limit of construction cost for this project is \$5,357,667. Table 1 illustrates the Opinion of Probable Construction Cost (OPCC) for the base bid items. A detailed OPCC can be referenced in **Appendix A**. The quantities are estimated based on the conceptual layout within this document..

PC-0701 and PC-0729 Budget	
OKC Fixed Limit of Construction	\$3,383,424
ACOG/ODOT Sixed Limit of Construction	\$1,974,243
Total Fixed Limit of Construction	\$5,357,667
Estimated Base Bid	\$5,321,020
Alternate #1	\$552,590

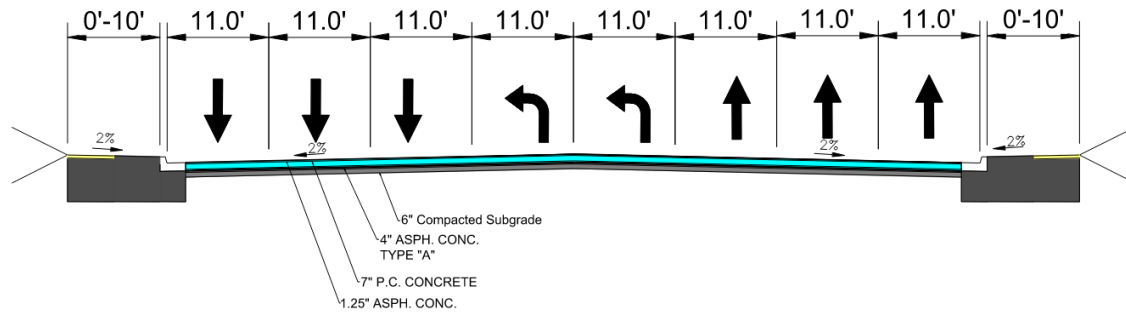
1.4 Summary of Base Bid

The Base Bid items were evaluated, and a decision matrix was made to help summarize each item as well as list the associated advantages and disadvantages of each item. The opinion of probable construction cost of the base bid and add alternates is also summarized. Please reference the Decision Matrix Table on the next sheet.

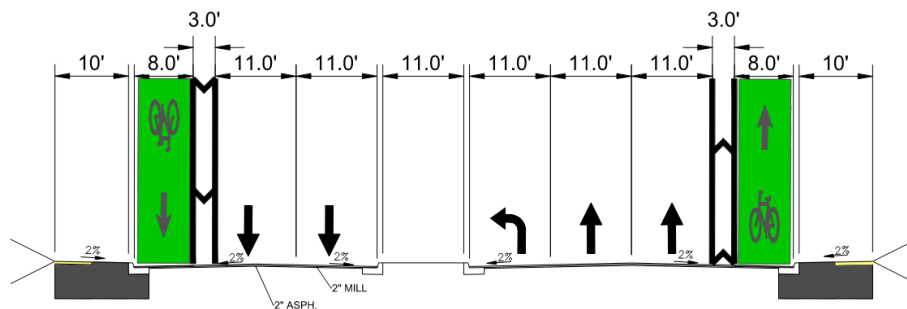
DECISION MATRIX TABLE

BASE BID for PC-0701 and PC-0729		
Items to be included	Advantage	Disadvantage
Asphalt mill and overlay – entire extents of project limit	Creates a smooth surface after re-organizing the lanes and smoother for bike lanes	
Bike lane throughout the corridor in both north and south directions	Provides a Tier 1 bike facility	
Storm sewer upgrades at NW 9 th and Classen	Assist in minimizing flooding impacts	
Pedestrian signal modifications at existing signals	PROWAG compliant signalization for pedestrians	
Radar detection upgrades	Necessary if road is milled and overlaid	
Sidewalks both sides of the corridor	Completion of the ADA path along both sides of the corridor	
Bus Pad upgrades with bicycle lanes behind the stops	ADA compliant, reduced conflicts with bicycle and bus	ROW will be necessary
Lighting Upgrades and Median Revisions	Improved Lighting with Matching Light Poles and Fixtures. Consistent median	
Removal of Channelized Right Turn Lane (Main & Classen)	Improved Traffic Flow and walkability	
Crack Seal Existing Concrete Pavement	Provide a longer life of the pavement	
OPCC for Base Bid - \$5,321,020		
ADD ALTERNATE 1		
Items to be included	Advantage	Disadvantage
Remove and replace concrete pavement in street corridor and upgrade concrete hooded inlets to standard OKC inlets	Provide a longer life of the pavement	
OPCC Add Alternate 1- \$552,590		

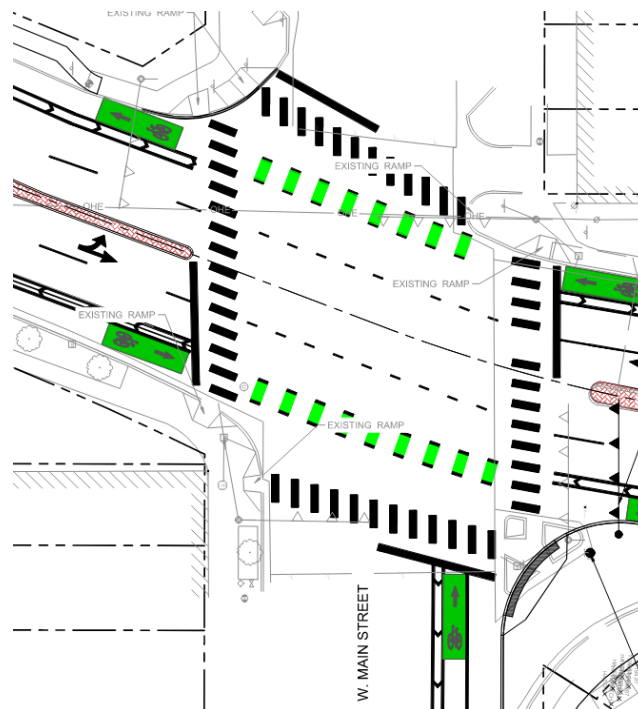
The following sections indicate the proposed re-configuration of the right-of way to incorporate the proposed bike lane and sidewalks.



Classen Boulevard - Existing Typical 6-Lane Configuration



Classen Boulevard - Proposed Typical 4-Lane Configuration



Classen Boulevard- Typical Intersection

1.5 Recommendations

Kimley-Horn recommends proceeding with the base bid items for the final design for PC-0701 and PC-0729. The base bid items shall include the following along the corridor of Classen Boulevard between NW 10th and Sheridan Avenue:

- Asphalt Mill and Overlay- Full extents of Classen Boulevard where asphalt exists
- Bike Lane Improvements- Northbound and Southbound lanes of project extents
- Sidewalk Improvements - Both sides of the corridor.
- ADA Pedestrian Signal Improvements – Signalized intersections of extents
- Storm Sewer Improvements at NW 9th and Classen Boulevard
- Bus Pad Upgrades with bicycle lanes behind the bus pads
- Lighting and median upgrades
- Removal of Channelized Right Turn Lane (Main Street and Classen Boulevard
- Crack Seal Existing Concrete Pavement

If available funding is identified the Add Alternate No. 1 may be considered.

2.0 Scope

Kimley-Horn was contracted by the City of Oklahoma City to provide design services for street enhancements along Classen Boulevard between North Sheridan Avenue and NW 10th Street. Classen Boulevard is a six-lane divided boulevard that functions as a main thoroughfare for the northwest to the downtown Oklahoma City. The nearby residents and the City officials desire to make the boulevard more conducive to all modes of transportation.

The project base bid scope includes reducing the vehicle lanes from six lanes to four lanes making a protected level one bicycle facility in each direction. The project scope also includes adding an appropriate sidewalk ADA path along both sides of the roadway as well as upgrading the pedestrian traffic facilities and radar detection for the bicycle facilities. The bicycle facilities will be designed to go behind the proposed bus pads. The bus pad areas are also designed with future expansion capabilities. Asphalt milling and overlaying through the corridor and repair of storm sewer at NW 9th and Classen are also included in the base scope of work. Providing crack seal of the existing concrete pavement of the concrete within the street corridor will be included. Lighting in the center median will be upgraded with new poles and LED lighting along with the modifications to the center median. An existing channelized turn lane at Main Street and Classen Boulevard will also be included in the base bid.

The Alternate No. 1 scope includes removing and replacing the existing concrete pavement within the corridor where the side streets intersect with Classen Boulevard. This would upgrade the pavement for the ADA path within the street and provide less future maintenance for the City. Alternate No. 1 would also remove and replace the existing concrete hooded inlets in the corridor limits. If Alternate No. 1 is chosen the crack seal and repair will be removed from the base bid as it will not be necessary if the concrete pavement is replaced.

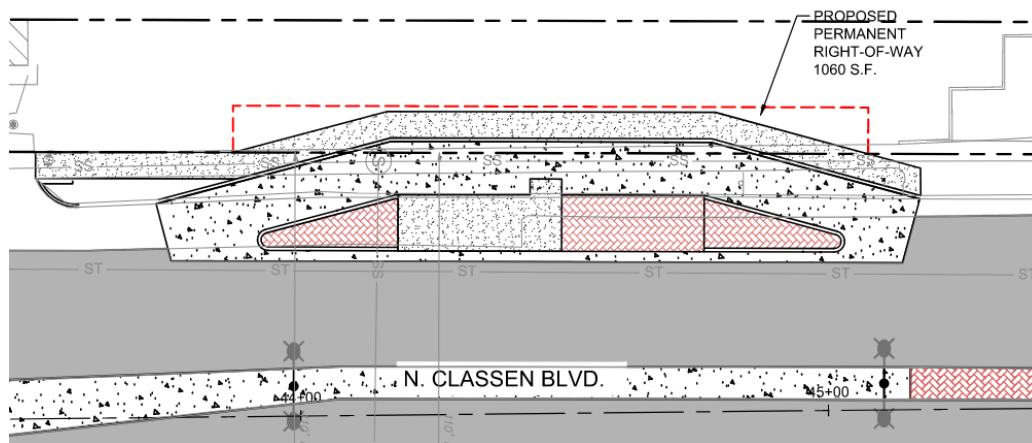


Project Limits
Classen Boulevard from N. Sheridan Avenue to NW 10th Street

3.0 Existing Conditions

3.1 Pavement - Roadway, Drives, and Alleys

The corridor consists of six lanes of traffic and most of the corridor has a small raised concrete median. The corridor is approximately 0.85 miles long. Most of the right of way width is 110 feet but it does vary throughout the corridor. The study corridor intersects with 12 streets and 11 platted alleys. Four pockets of on-street parking are found along the corridor. The corridor also has 3 bus stops, one bus shelter, and connects to the Bus Rapid Transit Corridor and along NW 10th Street. Some Right of Way will be necessary for placing the bike lanes behind the stops. See below for an example of ROW needs at some bus stop areas.



Typical ROW needs at Proposed Bus Stops along Classen Boulevard

According to as-built drawings and observed conditions, it appears that Classen Boulevard is a concrete street and the area between Main Street and NW 10th Street has an asphalt overlay on top of an older concrete street. Classen between N. Sheridan and Main Street is concrete as well as the 10th Street intersection. There are some areas of concrete at many of the connections of the cross streets. The asphalt is good to moderate condition with reflective cracking noted at the underlying concrete joints. The concrete was noted also in good to moderate condition. The alley, connecting drives, and alleys were in moderate to poor condition.



Classen Boulevard – Existing Concrete Pavement

Concrete pavement was noted on Classen Boulevard between Sheridan and Main Street and at the Intersection of NW 10th Street. These areas were noted in good to moderate condition. Some past patching was noted at some joint areas. Cracking was noted in some panels. Some crosswalks are within concrete areas which have some limited cracking but no displacement. Potholes, alligator cracking or other indications of base failure were limited in the main reaches of concrete pavement along Classen Boulevard Areas.

The existing concrete is within ADA tolerances. Crack Seal treatment is included in the base bid project scope for the concrete within the corridor limits. Alternate No. 1 is proposed to remove and replace the concrete panels within the corridor in lieu of crack seal.



Classen Boulevard – Existing Asphalt Pavement

Asphalt overlay on concrete pavement base is noted on the majority of Classen Boulevard. The condition of the asphalt pavement is moderate to good. Reflective cracking is noted along many of the underlying concrete joint locations.. Potholes, alligator cracking, or other indications of base failure were limited within the main reaches of asphalt along Classen Boulevard. This base bid design includes mill and overlay. Geotechnical testing will be necessary to confirm the existing pavement depth.



Alleys and Drives

Many of the alleys and drives are in moderate to poor conditions. The project will evaluate the ADA compliance with each drive. If there are grade challenges or poor pavement conditions preventing a safe pedestrian pathway, the private drives will be replaced. Alley drives will be replaced unless the alley is blocked.



Curbs and Gutters along Classen Boulevard

Curbs along Classen Boulevard are noted in the as-built drawings as typical 6" curbs with 2' gutters. Much of the extent of the curb and gutters are in good condition. There were some areas where there is noted damage to the existing curbs. In some areas there is no visible gutter, and the asphalt overlay abuts the curb. This project will include repairing portions of missing, damaged or mismatched curb and gutter along the corridor. The median will be a solid pour and will not have a curb and gutter.





3.2 Drainage of Classen Boulevard

Inlets were designed to capture the surface flows along the street and flow to underground storm sewer network below Classen Boulevard. Much of the storm sewer network is older as much of this portion of the City is older. There are some inlets with steel hoods and steel grates and other inlets that are older concrete hoods. Some inlets are in good condition and others are not. It is not within the scope of this project to replace broken or older inlets. Only inlets that are noted in a known flooding area or those that conflict with an ADA path will be replaced. Inlet grates that conflict with the directional travel of a bicycle will also be replaced.

The City did note one area of known flooding at the SW corner of NW 9th and Classen Boulevard. The analysis of this drainage basin is discussed in **Section 5.0** and detailed calculations are included in **Appendix C**.

Other drainage areas of consideration are the ongoing water ponding at the SW corner of NW 8th and Classen Boulevard. As seen in the field and noted within the pictures below, a constant trickle of water exists in this area despite an arid weather pattern or lack of irrigation. Upon speaking with the property owner, it was noted that the City may have previously investigated this area for a possible water leak. Other possible consideration is groundwater seepage. For this condition, an underground French drain system will be included in the pavement improvements. If during construction, a water leak is found City Utilities Department should be notified for repairs.

3.3 Sidewalks and ADA Ramps

Classen Boulevard contains a mixture of sidewalks in excellent, fair, and poor conditions. Walks are also non-existent in some areas. Vehicles are sometimes parked on pedestrian walks due to the lack of separation between drives and walks. Curbs will be added to restrict adjacent parking on the sidewalk path. Some of the existing ADA ramps and crossings do not meet ADA guidelines or are noted in poor conditions.



3.4 Parking

There is limited on-street parking and in many areas the on-street parking is not currently utilized. Some businesses do have additional off-street parking areas while others only have the on-street parking. Many of the existing on-street parking areas do not meet Oklahoma City Code requirements. Those parking spaces which do not meet Code will either be eliminated or brought into Code compliance.

3.5 Median

The majority of Classen Boulevard within the project corridor has an existing raised concrete median. The median varies in width but much of it is only 4' in width. The curbs were originally designed as 6" in height from the as-built plan references. However, the actual height of the curb varies and mostly appears as 4" or less. The curbs are in moderate to good condition. There are some curbs that are missing. The top pavement of the median is in moderate to good condition. There is some unevenness in some areas. Some as-builts indicate median replacement projects where monolithic concrete pours were made for median upgrades.

3.6 Lighting

The existing street lighting is in the median and along the traffic signal poles. There are limited light fixtures on the outer edges of the right-of way. Some of the light poles are located on wooden poles and others are on metal poles. The metal poles show wear and could use a powder coating. The light fixtures are not LED bulbs. There is overhead wiring connecting the poles in the center median.

3.7 Traffic

The existing traffic counts were reviewed. The traffic counts indicated ADT volumes below 20,000. This indicates that 6 lanes of traffic are not warranted and can be reduced.

There are six signalized intersections. The intersection at NW 10th Street has FLIR detection and the other five have looped detection. Each of the signalized intersections contains pedestrian push poles. The current locations of the pedestrian push button poles are in locations that are not PROWAG guideline locations.

3.8 Bus Stops

There are three bus stops and one bus shelter along the corridor.



3.9 Utilities

A virtual utility conference was held on September 10, 2020. There were no utility conflicts noted at this level of plan design. Further utility coordination will be made as the plan design progresses. There is a noted OG&E wire which shares a lighting pole in the median just north of Main Street. We will work with OG&E on this relocation.

4.0 Design Elements

4.1 Re-Organize ROW

As noted above, the traffic counts warranted that the six-lane boulevard can be reduced to four lanes of traffic. The re-organization of the ROW will allow for a bicycle lane in each direction. Planned additional sidewalk will be placed with grass or paved buffer behind the curb.

4.2 Bicycle Lane

The Bicycle Lane will be a minimum of 6 feet in width with a 3-foot striped buffer. Total width shown in the drawings is 8' which includes the gutter area. It is important that this is a smooth area as well. The current road and gutter conditions are in moderate to good condition which is important for a bicycle lane. Inlets within the bike lane will be conducive for bike lanes. The striping of the bike lane will include multipolymer traffic striping. Delineators will be provided within the buffer strip. Green bike boxes will also be provided. The bicycle lane will be placed behind the proposed bus stops to avoid conflict with the bus loading at the street.

4.3 Sidewalks

The existing sidewalks that are in good pavement condition and comply with the ADA standards will remain. The sidewalks that do not comply with ADA standards will be replaced. The sidewalks will be a minimum of 5' where possible and 6' if sidewalks must be adjacent to the street. A minimum of 3' will be made if an obstruction exists. Preferred placement of the sidewalks will be within 1' of the property line but in some instances, this may not be achievable due to existing conditions. Each block will be reviewed to assess the placement of the sidewalks

4.4 Connectivity to elevated sidewalks

There are some businesses that have elevated sidewalks in comparison to the elevation within the ROW. In most areas, easy transitions can be made to connect the new sidewalk with these businesses. There is one parcel at NW 4th and Classen which will require a retaining wall and ramps.

4.5 ADA Ramp

Existing Ramps will be evaluated at each intersection. If the existing ramps are compliant with ADA guidelines, the pavement is in good condition, and the direction aligns with the needed pathway, then the ramp will remain. If these conditions are not met, the ramps will be removed and replaced. Ramps will run east / west across Classen only at the signalized intersections. Ramps will not be placed east / west across Classen Boulevard at non-signalized intersections. Ramps will follow the guidelines of the City of Oklahoma City standard details for directional ramps.

4.6 Pedestrian Push Buttons

New Ped Push Buttons will be placed at each signalized intersection. The push buttons will be placed to follow the guidelines set forth in the PROWAG.

4.7 Driveways

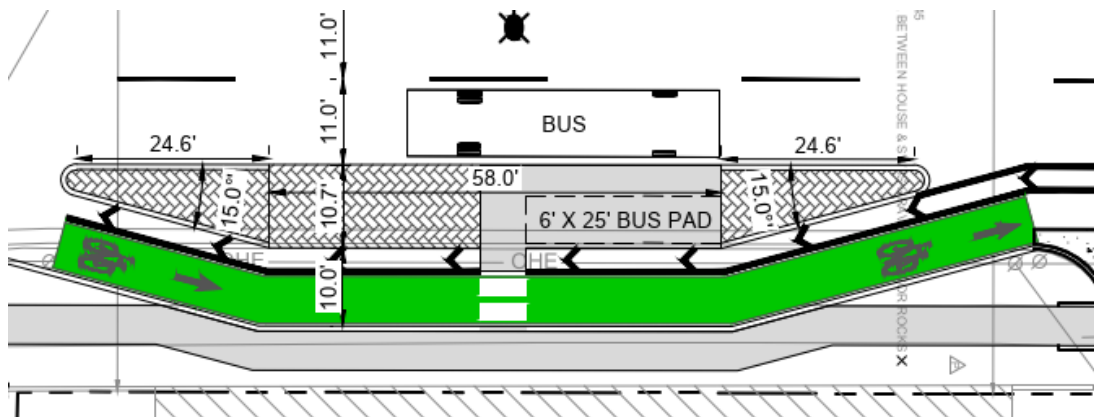
Each driveway is reviewed for pavement condition and existing slope. The base design includes removing and replacing those drives that are in conjunction with the base bid sidewalk. Each drive will be evaluated and replaced if it does not comply with standards for ADA crossings due to condition of the surface or the slope.

4.8 On- Street Parking

The current on-street parking will be removed in many areas. Only two areas of on-street parking will remain which are located on the east side of Classen south of NW 5th Street and south of NW 10th Street. These two areas will remain due to lack of additional off-street parking at the businesses. In these areas, the parking is designed as parallel parking instead of angled parking to conform to the bike lane safety. It is recommended to communicate these changes of parking to the owners of the property. A 3' buffer between the parking and bike lane will be designed.

4.9 Bus Stops

Kimley-Horn has coordinated with Embark on the location of the bus stops and the dimensions of the pad size. The base scope includes the required Embark 6' x25' at grade concrete bus pad that also has room for the pedestrian to maneuver from the sidewalk area to the bus. The spacing for the bus pad potentially accommodates excess capacity and future expansion. Stamped or colored concrete will be used for the areas of the bus area that are beyond the platform and regular walking path. The bike paths will run behind the bus pads to decrease conflicts between the bike rider and the bus loading. The bus pad areas themselves are 6" concrete and the surrounding sidewalk areas and stamped concrete will be 4" thick concrete. The bike paths behind the bus stops will be 6" concrete with 6" subgrade and include the green conflict markings. The grade of the bike path will be made with a high point at the pedestrian crossing to promote positive drainage back to the original curb alignment gutters. The sidewalk crossing in these areas will be made between the property area and the bike lane. Additional right-of-way is necessary to accommodate the bike lanes and pedestrian paths behind the bus pads.



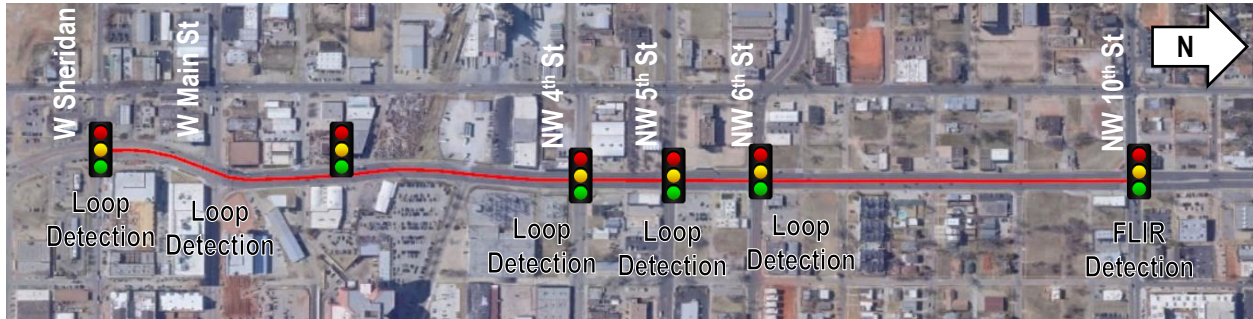
4.10 Milling and Overlay

The existing condition of Classen Boulevard asphalt pavement is in moderate to good condition. The addition of the bicycle lanes requires modification to the organization and existing striping of the lanes. As-built drawings indicate the existing roads are 8" concrete base with an asphalt overlay. Further geotechnical testing is needed to confirm the depth of the existing asphalt and concrete pavement. The scoped design includes a 2" mill and 2" overlay of asphalt throughout the corridor which will remove any existing striping of the lanes and provide a clean slate for new striping.

4.11 Traffic Signal Detection Upgrades

Along the length of the N Classen Blvd corridor, there are 6 signalized intersections at the following cross streets:

- W Sheridan Ave
- W Main St
- NW 4th St
- NW 5th St
- NW 6th St
- NW 10th St



N Classen Blvd at NW 10th St is currently equipped with FLIR thermal traffic detection. All other intersections employ loop detection. With the travel lane reconfiguration caused by the addition bike lanes to the corridor, loop detection locations may need to be moved or abandoned. It is recommended that the 5 intersections currently employing loop detection be upgraded to the current City detection standard, Wavetronix radar detection systems. Not only can the system be programmed to detect bicycle traffic at the intersection, but upgrade will provide the flexibility to accommodate any future geometry changes at the intersection.

4.12 Street Lighting and Median

The existing streetlights along much of the corridor are older. A mixture of timbers poles and steel poles with high pressure sodium fixtures, and aerial electrical connection exists along the median of the roadway. The existing corridor light is not aesthetically pleasing for the corridor and does not provided a significant coverage of the existing roadway.

The base bid scope of work proposes to replace all of the light poles and bases within the median corridor limits, upgrade the light fixtures and eliminate the overhead wiring by placing underground conduit and wiring. The light fixtures replacements will be coordinated further with OG&E and City staff.

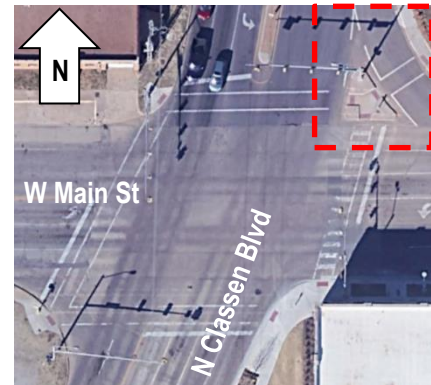
The removal of the light pole and bases will require the median to be removed and replaced. During the removal of the median, conduit and aluminum wiring will be placed underground in lieu of the existing aerial wires. The existing medians will be saw cut out and the new medians will be a monolithic concrete pour which will be doweled into the existing pavement. The end caps of the medians and around the art wall at the split level will be stamped concrete to match the bus stop area and the remaining median extents will be standard concrete.



4.13 Removal of the Existing Channelized Right Turn Lane

The proposed bicycle facilities along N Classen Blvd are anticipated to connect with the W Main St bicycle improvements (project by others). The westbound to northbound channelized right-turn movement and associated island creates additional pedestrian and bicycle conflicts with motor vehicles. As part of this project, the existing channelized right turn lane was evaluated to be removed and converted to a typical intersection approach/pedestrian approach as an alternate option for this project. The cost estimate also includes removing and replacing the existing traffic signal equipment. It may be possible that the existing traffic signal equipment is in good condition and should be salvaged during demolition and reused for another project. To minimize downtime at the existing signalized intersection, a new pole and mast arm assembly is recommended for quick change over of operations.

Truck turning movements were analyzed to establish the radius. A diagonal ADA ramp will be utilized at this intersection to better align with the existing ramps and concrete sidewalk will be placed behind the curb line.



5.0 Drainage

5.1 Drainage Alterations due to conflicts

In some area of the corridor, alterations to the existing inlets must be made due to conflicts with the ADA path. In those instances, the existing inlet will be removed and new inlets with associated manholes and piping will be constructed. Two locations are currently noted as needing drainage revisions. They are located at NW 1st Street and NW 6th Street.

5.2 Drainage Alterations due to known flooding

During the scoping of the project, an area was noted as having known flooding. The property is located at the Southwest corner of NW 9th and Classen Boulevard. As-built plans were reviewed, and survey was collected within the area. The City also provided information from a CCTV scan and the surveyor also ran a scan within the manholes. Existing brick pipe networks were noted, and some lines appeared to be undersized and/or collapsed.

The project analyzed possible solutions to minimize localized flooding near the intersection of NW 9th and Classen. The base bid includes removing and replacing the pipe in the middle of NW 9th Street between Francis and Classen Boulevard as well as the inlets at the intersection of Francis and NW 9th. This system appeared to be collapsed and limited function. The base bid also includes removing and increasing the size of an existing inlet in the median of the north bound lane of Classen and NW 9th Street. The drainage appears to accumulate near the southbound lane of NW 9th Street and Classen. The base bid will add an additional inlet at this location.

The project scope did not include expanding the analysis to other pipes in the area. During the review, it was noted that there are some older brick boxes in this area. The City may desire to replace additional older lines prior to any pavement work.

Please reference the drainage calculations within the attached drainage report in **Appendix D. All replaced drainage structures conform to Oklahoma City Design Standards.**

6.0 Right-of Way

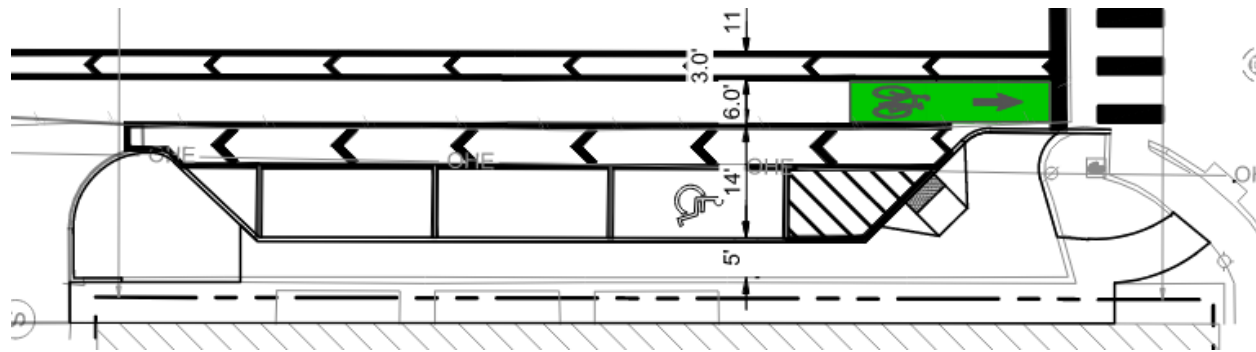
Right-of-Way will be necessary to accommodate areas where the pedestrian path must cross the existing Right of way as noted below:

Acct #	Owner	Reason for ROW	Plan Sheet Number
R013206880	York Raymond P & Yvonne J	Sidewalk ramp	C2.05
R013841400	Harris Woodrow & Maytree CO TRS	Parcel Missing increased ROW	C 2.11
R013842660	Oklahoma Transmission Supply Inc.	Parcel Missing increased ROW	C 2.11
R013840700	Harris Mayree & Woodrow Co TRS	Parcel Missing increased ROW	C 2.12
R013840140	Oklahoma County	Parcel Missing increased ROW	C 2.12
R01309280	Knight Cecil & Carol Rev Living Trust	Elevated Sidewalk near building	C 2.13
R013207104	Independent School District 89	Bus Stop	C 2.14 & C 2.15
R013201632	Far Wespen LLC	Bus Stop	C 2.16

7.0 Coordination with Property Owners

Coordination with all property owners to make them aware of the project scope, schedule and construction sequence is recommended. Individual meetings should be made with property owners who are affected by the following:

- Right of Way Changes - due to bus stops or lacking right-of way
- Grade Changes at the door front
- Parking Changes in the ROW



8.0 Conclusion

8.1 Project Scope

Classen Boulevard has long been an important part of Oklahoma City. It was originally constructed as a corridor to connect a local neighborhood to the downtown area. It also was the location of one of the first streetcar projects in Oklahoma City. Over the years the corridor has been modified and it remains a vital connection.

Classen Boulevard between N. Sheridan and NW 10th Street is a six-lane divided boulevard that functions as a main thoroughfare for the west side of downtown Oklahoma City. The nearby residents and the City officials desire to make the boulevard more conducive to all modes of transportation.

The project scope includes reducing the vehicle lanes from six lanes to four lanes making a protected level one bicycle facility in each direction. The project scope also includes adding an appropriate sidewalk ADA path along both sides of the roadway as well as upgrading the pedestrian traffic facilities and radar detection for the bicycle facilities. The bicycle facilities will be designed to go behind the proposed bus pads. The bus pad areas are also designed with future expansion capabilities. Asphalt milling and overlaying through the corridor and repair of storm sewer at NW 9th and Classen are also included in the base scope of work. Lighting in the center median will be upgraded with new poles and LED lighting along with the modifications to the center median. An existing channelized turn lane at Main Street and Classen Boulevard will also be included in the base bid.

8.2 Schedule

Once the preliminary plans have been approved, the project will begin Final Plan tasks and the NEPA Environmental process with ODOT can begin. The NEPA Environmental process can run simultaneously with the other submittals and will take approximately 10 months. The submittal of 60% and 90% plans will be completed in approximately 6 months which includes the submittals, reviews, and responses to the comments. The ODOT letting process will take approximately 3 months and the bidding 2 months. ODOT also allows a 3-month flex start which is also taken into the schedule. Construction will commence following the bidding and is estimated to take 1 year. The anticipated completion time is July 2024

	May-22	July-22	July-22	Aug-22	Sep-22	Oct-22	Nov-22	Dec-22	Jan-23	Feb-23	Mar-23	Apr-23	May-23	June-23	July-23	Aug-23	Sep-23	Oct-23	Nov-23	Dec-23	Jan-24	Feb-24	Mar-24	Apr-24	May-24	June-24	July-24	Aug-24
Acceptance of Preliminary Report																												
NEPA Environmental																												
60% Submittal, Review and Respond to Comments																												
90% Submittal, Review and Repspond to Comments																												
Letting																												
Bidding																												
Flex Start																												
Construction																												

8.3 Budget

The fixed limit of construction cost for this project is \$5,357,667. Table 1 illustrates the Opinion of Probable Construction Cost (OPCC) for the base bid items. A detailed OPCC can be referenced in **Appendix A**. The quantities are estimated based on the conceptual layout within this document.

PC-0701 and PC-0729 Budget	
OKC Fixed Limit of Construction	\$3,383,424
ACOG/ODOT Sixed Limit of Construction	\$1,974,243
Total Fixed Limit of Construction	\$5,357,667
Estimated Base Bid	\$5,321,020
Alternate #1	\$552,590

8.4 Summary of Base Bid

The Base Bid items were evaluated, and a decision matrix was made to help summarize each item as well as list the associated advantages and disadvantages of each item. The opinion of probable construction cost of the base bid and add alternates is also summarized. Please reference the Decision Matrix Table on the next sheet.

DECISION MATRIX TABLE

BASE BID for PC-0701 AND PC-0729		
Items to be included	Advantage	Disadvantage
Asphalt mill and overlay – entire extents of project limit	Good option for creating a smooth surface after re-organizing the lanes and smoother for bike lanes	
Bike lane throughout the corridor in both north and south directions	Provides a Tier 1 bike facility	
Storm sewer upgrades at NW 9 th and Classen	Assist in minimizing flooding impacts	
Pedestrian signal modifications at existing signals	PROWAG compliant signalization for pedestrians	
Radar detection upgrades	Necessary if road is milled and overlaid	
Sidewalks both sides of the corridor	Completion of the ADA path along both sides of the corridor	
Bus Pad upgrades with bicycle lanes behind the stops	ADA compliant, reduced conflicts with bicycle and bus	ROW will be necessary
Lighting Upgrades and Median Revisions	Improved Lighting with Matching Light Poles and Fixtures. Consistent median	
Removal of Channelized Right Turn Lane (Main & Classen)	Improved Traffic Flow and walkability	
Crack Seal Existing Concrete Pavement	Provide a longer life of the pavement	
OPCC for Base Bid - \$5,321,020		
ADD ALTERNATE 1		
Items to be included	Advantage	Disadvantage
Remove and replace concrete pavement in street corridor and upgrade concrete hooded inlets to standard OKC inlets	Provide a longer life of the pavement	
OPCC Add Alternate 1- 552,590		

8.5 Recommendations

Kimley-Horn recommends proceeding with the base bid items for the final design for PC-0701 AND PC-0729. The base bid items shall include the following along the corridor of Classen Boulevard between NW 10th and Sheridan Avenue:

- Asphalt Mill and Overlay- Full extents of Classen Boulevard where asphalt exists
- Bike Lane Improvements- Northbound and Southbound lanes of project extents
- Sidewalk Improvements- Both sides of the corridor.
- ADA Pedestrian Signal Improvements – Signalized intersections of extents
- Storm Sewer Improvements at NW 9th and Classen Boulevard
- Bus Pad Upgrades with bicycle lanes behind the bus pads
- Lighting and median upgrades
- Removal of Channelized Right Turn Lane (Main Street and Classen Boulevard)
- Crack Seal Existing Concrete Pavement

If available funding is identified the Add Alternate No. 1 may be considered.

8.6 Appendices

- Appendix A: Opinion of Probable Construction Cost
- Appendix B: Preliminary Plans
- Appendix C: Drainage Report and Calculations



Appendix A: Opinion of Probable Construction Cost

Client:	City of Oklahoma City	Date:	12/1/2021
Project:	PC-0701	Prepared By:	LML/LAS
	Classen Street Enhancements from Sheridan to NW 10th Street	Checked By:	LML

Item No.	Item Description	Quantity	Unit	Unit Price	Cost
DEMOLITION AND MOBILIZATION					
1	CLEARING AND GRUBBING (2%)	1	LS	\$117,869	\$117,869
2	MOBILIZATION (5%)	1	LS	\$294,672	\$294,672
3	COLOR AUDIO/VIDEO RECORDING PRE & POST CONSTRUCTION DVD	1	LS	\$2,750	\$2,750
4	CONSTRUCTION STAKING SURVEY (1%)	1	LS	\$58,934	\$58,934
5	CONSTRUCTION STAKING (CONSTRUCTION SURVEY) (1%)	1	LS	\$58,934	\$58,934
6	TRAFFIC CONTROL (2%)	1	LS	\$117,869	\$117,869
7	SAW CUT	2,231	LF	\$4	\$8,925
8	REMOVE EXISTING SIDEWALK	2,620	SY	\$14	\$36,680
9	REMOVE EXISTING ADA RAMP	509	SY	\$12	\$6,108
10	REMOVE CURB AND GUTTER	2,400	LF	\$12	\$28,800
11	REMOVE DRIVEWAY	1,760	SY	\$13	\$22,880
12	REMOVE ON-STREET PARKING	230	SY	\$22	\$5,060
13	REMOVE EXISTING STREET	900	SY	\$22	\$19,800
14	ADJUST EXISTING MANHOLES HEIGHT	3	EA	\$1,232	\$3,696
15	PROVIDE AND SET NEW MANHOLE RING AND COVER	3	EA	\$1,232	\$3,696
16	REMOVE EXISTING RAILROAD TRACKS	100	LF	\$220	\$22,000
17	REMOVE ON- STREET PARKING	420	SY	\$22	\$9,240
18	REMOVE CONCRETE STEPS	90	LF	\$33	\$2,970
19	REMOVE AND RELOCATE (PEDESTRIAN PUSH BUTTON POLE)	1	EA	\$1,650	\$1,650
20	RELOCATE TRAFFIC SIGNAL POLE AND MAST ARM	1	EA	\$22,000	\$22,000
21	REMOVE/RELOCATE EXISTING SIGNS	20	EA	\$187	\$3,740
22	REMOVE INLET	7	EA	\$2,750	\$19,250
23	REMOVE MANHOLE	2	EA	\$3,300	\$6,600
24	REMOVE STORM SEWER (RCP)	574	LF	\$55	\$31,570
25	REMOVE TRAFFIC STRIPE (4-INCH/8-INCH/24-INCH)	1,000	LF	\$3	\$3,000
26	SWPPP	1	LS	\$4,400	\$4,400
27	FIBER LOG	4,000	LF	\$11	\$44,000
28	INLET BARRIERS	39	EA	\$275	\$10,725
STREETSCAPE PAVING IMPROVEMENTS					
1	TACTILE MARKER/ TRUNCATED DOMES	450	SF	\$33	\$14,850
2	4" CONCRETE SIDEWALK	4,916	SY	\$77	\$378,508
3	4" CONCRETE SIDEWALK (STAMPED CONCRETE)	391	SY	\$119	\$46,547
4	6" CONCRETE PAVEMENT (H.E.S.)	1,760	SY	\$101	\$177,760
5	6" CONCRETE PAVEMENT (BIKE PATH)	607	SY	\$101	\$61,307
6	8" PERMANENT ASPHALT STREET REPAIR	80	SY	\$121	\$9,680
7	8" STABILIZED SUBGRADE	411	SY	\$4	\$1,644
8	CRACK SEAL CONCRETE PAVEMENT	9,482	LF	\$3	\$28,446
9	GRADING AND EARTHWORK ALLOCATION	1	LS	\$22,000	\$22,000
10	CURB AND GUTTER (2'-6")	2,376	LF	\$39	\$92,664
11	TRAFFIC STRIPE (MULTI-POLYMER - EPOPLEX LS65) (4-INCH)	3,893	LF	\$2	\$7,786
12	TRAFFIC STRIPE (MULTI-POLYMER - EPOPLEX LS65) (8-INCH)	16,081	LF	\$4	\$64,324
13	TRAFFIC STRIPE (MULTI-POLYMER - EPOPLEX LS65) (24-INCH)	2,522	LF	\$13	\$32,786
14	TRAFFIC STRIPE (MULTI-POLYMER - EPOPLEX LS65) (ARROWS)	19	EA	\$94	\$1,786
15	TRAFFIC STRIPE (MULTI-POLYMER - EPOPLEX LS65) (SYMBOLS-WORDING)	5	EA	\$341	\$1,705
16	TRAFFIC STRIPE (MULTI-POLYMER - EPOPLEX LS65) (GREEN PAINT WITH CRUSHED GRANITE)	11,065	SF	\$18	\$199,175
17	TRAFFIC STRIPE (MULTI-POLYMER - EPOPLEX LS65) (BIKE LANE SYMBOL)	48	EA	\$440	\$21,120
18	TRAFFIC STRIPE (MULTI-POLYMER - EPOPLEX LS65) (SHARROW SYMBOL)	6	EA	\$440	\$2,640
19	DELINEATOR PROVIDE AND INSTALL (BIKE LANE BUFFER)	700	EA	\$72	\$50,400
20	RETAINING WALL	63	LF	\$330	\$20,790
21	HANDRAIL	63	LF	\$121	\$7,623
22	SLAB SOD	5,712	SY	\$5	\$28,560
23	5' PRECAST MANHOLE	1	EA	\$3,410	\$3,410
24	REINFORCED CONCRETE PIPE 18 INCHES O-RING	564	LF	\$77	\$43,428
25	STD. 2-0 INLET COMPLETE IN PLACE	4	EA	\$3,300	\$13,200
26	STD. 2-2 INLET COMPLETE IN PLACE	2	EA	\$5,500	\$11,000

Client:	City of Oklahoma City	Date:	12/1/2021
Project:	PC-0701	Prepared By:	LML/LAS
	Classen Street Enhancements from Sheridan to NW 10th Street	Checked By:	LML

Item No.	Item Description	Quantity	Unit	Unit Price	Cost	
27	AGGREGATE BASE (TYPE A)	245	CY	\$94	\$23,030	
28	CUSTOM INLET/JUNCTION BOX	1	EA	\$11,000	\$11,000	
29	UNDER DRAIN	60	LF	\$130	\$7,800	
TRAFFIC SIGNAL IMPROVEMENTS						
1	PEDESTRIAN SIGNAL HEAD	8	EA	\$825	\$6,600	
2	PEDESTRIAN PUSH BUTTON	36	EA	\$1,320	\$47,520	
3	CONDUIT AND WIRING ALLOCATION	1	LS	\$11,000	\$11,000	
4	PEDESTAL POLE WITH 5-FOOT MOUNTING HEIGHT	28	EA	\$1,760	\$49,280	
5	PEDESTAL POLE WITH 10-FOOT MOUNTING HEIGHT	8	EA	\$2,200	\$17,600	
6	STRUCTURAL CONCRETE	14	CY	\$550	\$7,700	
7	REINFORCING STEEL	1,325	LB	\$3	\$3,975	
8	PULL BOX TYPE I	1	EA	\$1,100	\$1,100	
9	PULL BOX ADJUSTMENT	17	EA	\$770	\$13,090	
10	WAVETRONICS RADAR DETECTION (PER INTERSECTION)	5	INT	\$82,500	\$412,500	
MILL AND OVERLAY						
1	COLD MILLING PAVEMENT - 2" MILL	29,770	SY	\$11	\$327,472	
2	2" ASPHALT TYPE S-5 OVERLAY	3,270	TON	\$132	\$431,640	
3	TACK COAT	4,466	GAL	\$6	\$26,793	
4	RAISE/LOWER VALVE ALLOCATION	1	LS	\$3,300	\$3,300	
5	RAISE/LOWER MANHOLE ALLOCATION	1	LS	\$6,600	\$6,600	
RECONSTRUCT MEDIAN PAVEMENT AND MEDIAN STREET LIGHTING						
1	REMOVAL OF EXISTING MEDIAN CURB AND GUTTER	5,323	LF	\$17	\$90,491	
2	REMOVAL OF MEDIAN PAVEMENT	2,370	SY	\$11	\$26,070	
3	REMOVAL OF EXISTING LIGHT POLES	30	EA	\$1,650	\$49,500	
4	REMOVAL OF EXISTING SIGNS ALLOCATION	1	LS	\$1,100	\$1,100	
6	STAMPED CONCRETE	10,295	SF	\$15	\$154,425	
8	REPAVE EXISTING MEDIANS	1,164	SY	\$101	\$117,564	
9	DUAL LED STREET LIGHTS	37	EA	\$7,700	\$284,900	
10	SINGLE LED STREET LIGHTS	5	EA	\$5,500	\$27,500	
11	CONDUIT AND WIRING ALLOCATION	4800	LF	\$39	\$187,200	
Basis for Cost Projection: <div><input type="checkbox"/> No Design Completed</div> <div><input checked="" type="checkbox"/> Preliminary Design</div> <div><input type="checkbox"/> Final Design</div>		Subtotal:			\$4,657,708	
		Conting. (%,+/-)			\$10	\$466,000
		Years	Percent			
		Inflation	2	\$0	\$ 284,000	
		BASE BID TOTAL			\$5,407,708	

This total does not reflect engineering services, technical services, or property acquisition cost.

The Engineer has no control over the cost of labor, materials, equipment, or over the Contractor's methods of determining prices or over competitive bidding or market conditions. Opinions of probable costs provided herein are based on the information known to Engineer at this time and represent only the Engineer's judgment as a design professional familiar with the construction industry. The Engineer cannot and does not guarantee that proposals, bids, or actual construction costs will not vary from its opinions of probable costs.

Client:	City of Oklahoma City	Date:	12/1/2021
Project:	PC-0701	Prepared By:	LML/LAS
	Classen Street Enhancements from Sheridan to NW 10th Street	Checked By:	LML
Rec:	Southbound Right Turn Lane		

Item No.	Item Description	Quantity	Unit	Unit Price	Cost
DEMOLITION AND MOBILIZATION					
1	SAW CUT	3,037	LF	\$4	\$12,147
4	REMOVE CURB AND GUTTER	1,100	LF	\$12	\$13,200
2	REMOVE ROADWAY	2,265	SY	\$15	\$33,971
STREETSCAPE PAVING IMPROVEMENTS					
1	8" CONCRETE PAVEMENT (H.E.S.)	2,265	SY	\$130	\$294,414
2	8" STABILIZED SUBGRADE	2,571	SY	\$4	\$10,284
3	GRADING AND EARTHWORK ALLOCATION	1	LS	\$22,000	\$22,000
4	CURB AND GUTTER (2'-6")	1,100	LF	\$39	\$42,900
16	SLAB SOD	200	SY	\$5	\$1,000
2	REMOVE AND REPLACE CONCRETE HOODED INLET	9	EA	\$5,000	\$45,000
RECONSTRUCT MEDIAN PAVEMENT AND MEDIAN STREET LIGHTING					
2	REMOVAL OF MEDIAN PAVEMENT (TURN DIV E SIDE ON 8TH ST)	6	SY	\$11	\$69
8	REPAVE EXISTING MEDIANS	6	SY	\$101	\$606

Basis for Cost Projection:

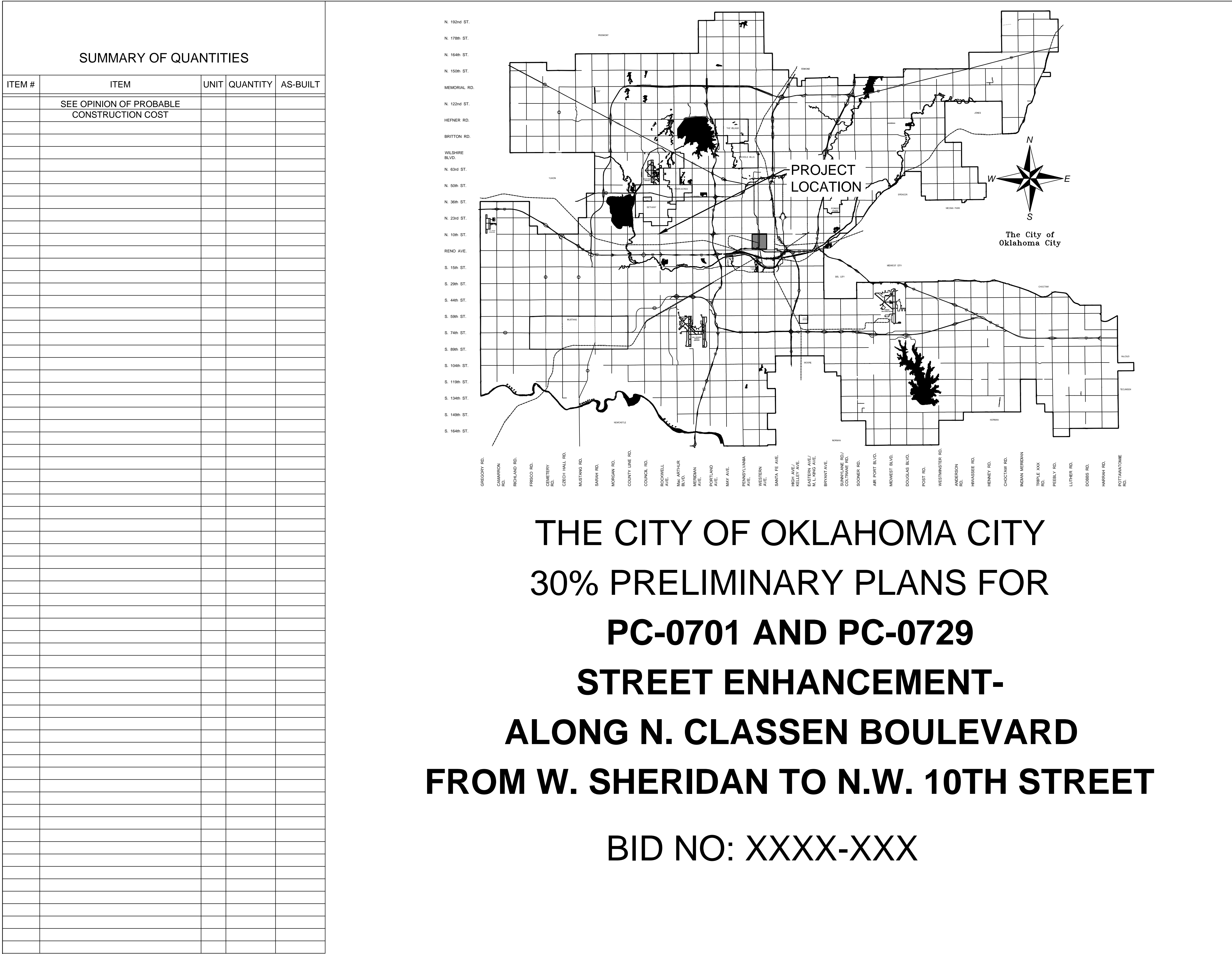
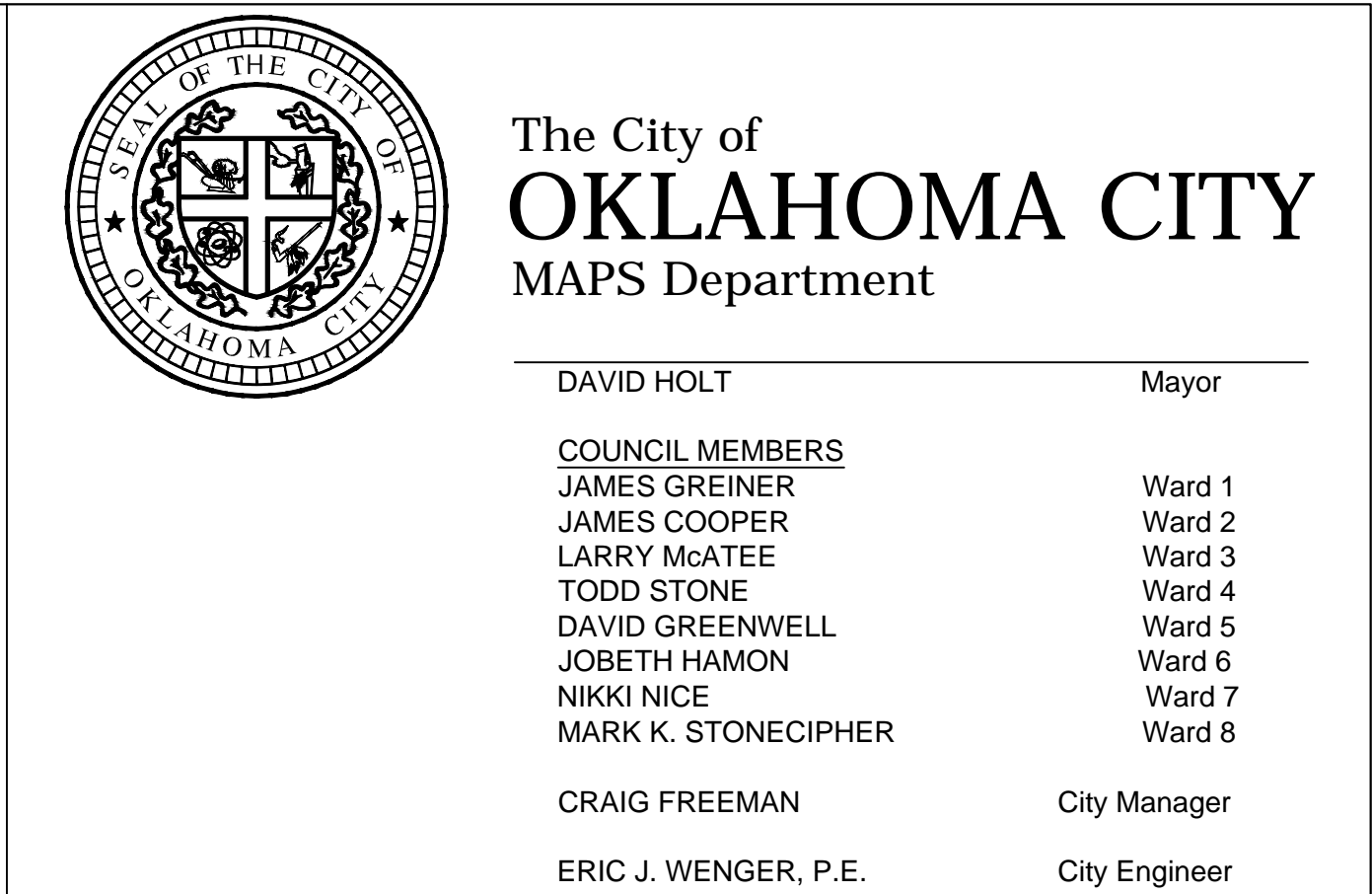
- ☐ No Design Completed
☒ Preliminary Design
☐ Final Design

Subtotal:		\$475,590
Conting. (%,+/-)	10	\$48,000
Years	Percent	
Inflation 2	3%	\$ 29,000
BASE BID TOTAL		\$552,590

This total does not reflect engineering services, technical services, or property acquisition cost.

The Engineer has no control over the cost of labor, materials, equipment, or over the Contractor's methods of determining prices or over competitive bidding or market conditions. Opinions of probable costs provided herein are based on the information known to Engineer at this time and represent only the Engineer's judgment as a design professional familiar with the construction industry. The Engineer cannot and does not guarantee that proposals, bids, or actual construction costs will not vary from its opinions of probable costs.

Appendix B: Preliminary Plans

[illegible][illegible]

Sheet List Table	
Sheet Number	Sheet Title
C 0.00	COVER
C 0.01	GENERAL NOTES
C 0.02	OVERALL MAP
C-2.00	PAVEMENT IMPROVEMENTS (1 OF 10)
C 2.01	PAVEMENT IMPROVEMENTS (2 OF 10)
C 2.02	PAVEMENT IMPROVEMENTS (3 OF 10)
C 2.03	PAVEMENT IMPROVEMENTS (4 OF 10)
C 2.04	PAVEMENT IMPROVEMENTS (5 OF 10)
C 2.05	PAVEMENT IMPROVEMENTS (6 OF 10)
C 2.06	PAVEMENT IMPROVEMENTS (7 OF 10)
C 2.07	PAVEMENT IMPROVEMENTS (8 OF 10)
C 2.08	PAVEMENT IMPROVEMENTS (9 OF 10)
C 2.09	PAVEMENT IMPROVEMENTS (10 OF 10)
C 2.10	TRAFFIC & PAVEMENT MARKINGS (1 OF 10)
C 2.11	TRAFFIC & PAVEMENT MARKINGS (2 OF 10)
C 2.12	TRAFFIC & PAVEMENT MARKINGS (3 OF 10)
C 2.13	TRAFFIC & PAVEMENT MARKINGS (4 OF 10)
C 2.14	TRAFFIC & PAVEMENT MARKINGS (5 OF 10)
C 2.15	TRAFFIC & PAVEMENT MARKINGS (6 OF 10)
C 2.16	TRAFFIC & PAVEMENT MARKINGS (7 OF 10)
C 2.17	TRAFFIC & PAVEMENT MARKINGS (8 OF 10)
C 2.18	TRAFFIC & PAVEMENT MARKINGS (9 OF 10)
C 2.19	TRAFFIC & PAVEMENT MARKINGS (10 OF 10)
C 3.00	EXISTING DRAINAGE AREA MAP
C 3.01	PROPOSED DRAINAGE AREA MAP
EXH1	9TH STREET STORM SEWER EXHIBIT

* THE STANDARD CITY OF OKLAHOMA CITY AND ODOT SHEETS, SPECIFICALLY IDENTIFIED IN THIS SHEET INDEX, HAVE BEEN SELECTED BY ME OR UNDER MY RESPONSIBLE SUPERVISION AS BEING APPLICABLE TO THIS PROJECT.

ONE CALL UTILITY LOCATION NUMBER	
<p>840-5032</p> <p>1-800-522-6543</p>	<p>This number is to be used for information on the location of all underground utilities. Contact this number and other numbers specified in the plans prior to any excavation.</p>

PREPARED BY

LYDIA M. LESLIE	DATE					
Kimley»Horn						
KIMLEY-HORN 14101 Wireless Way, Building A, Suite 150 Oklahoma City, OK 73134 405-241-5423 FIRM #2740	<table border="1"><tr><td>PUBLIC LIBRARY</td></tr><tr><td>FOR REVIEW ONLY Not for construction or permit purposes.</td></tr><tr><td>Kimley»Horn</td></tr><tr><td>Engineer LYDIA M. LESLIE</td></tr><tr><td>P.E. No. 18432 date APRIL 2022</td></tr></table>	PUBLIC LIBRARY	FOR REVIEW ONLY Not for construction or permit purposes.	Kimley»Horn	Engineer LYDIA M. LESLIE	P.E. No. 18432 date APRIL 2022
PUBLIC LIBRARY						
FOR REVIEW ONLY Not for construction or permit purposes.						
Kimley»Horn						
Engineer LYDIA M. LESLIE						
P.E. No. 18432 date APRIL 2022						

PRELIMINARY	
FOR REVIEW ONLY	
Not for construction or permit purposes.	
Kimley»Horn	
Engineer	LYDIA M. LESLIE
P.E. No. 18432	Date APRIL 2022

ERIC J. WENGER, P.E., DIRECTOR PUBLIC WORKS / CITY ENGINEER APPROVED AS FINAL PLANS	DATE
MAYOR	DATE
CITY CLERK	DATE

DATE _____

PROJECT NO. PC-0701

K:\OKC_Civil\061292816--PC-0701 Classen Streetscape\CADD\SHEETS\GENERAL NOTES.dwg 4/27/2022 3:38 PM

GENERAL NOTES:

- CONSTRUCTION WILL BE IN ACCORDANCE WITH THE "STANDARD SPECIFICATIONS FOR THE CONSTRUCTION OF PUBLIC IMPROVEMENTS", A PUBLICATION FURNISHED BY THE CITY OF OKLAHOMA CITY THAT OUTLINES THE MINIMUM STANDARDS OF WORKMANSHIP, MATERIALS, TESTING, AND METHODS OF CONSTRUCTION EXPECTED IN PUBLIC AND PRIVATE DEVELOPMENT WORK WITHIN THE OKLAHOMA CITY LIMITS.
- ANY PAY QUANTITY ITEM, OR QUALITY TESTING PROCEDURE OUTLINED IN THE CITY'S STANDARDS WHICH IS ESSENTIAL IN THE CONSTRUCTION PROCESS, CALLED FOR BY THE CITY'S CONSTRUCTION SPECIFICATIONS AND/OR THE PUBLIC WORK'S REPRESENTATIVE AT THE SITE, THAT IS NOT CLEARLY ADDRESSED IN THE PAY QUANTITY TABLE, OR THE CONTRACT AGREEMENT BETWEEN DEVELOPER AND CONTRACTOR, WILL BE CONSIDERED AS AN INCIDENTAL PAY ITEM, AND WOULD BE IMPLEMENTED AND PAID FOR BY CONTRACTOR AND/OR DEVELOPER.
- TESTING OF MATERIALS AND WORKMANSHIP WILL BE UNDERTAKEN AS OUTLINED IN THE CITY'S STANDARDS. RESULTS WILL BE PROVIDED TO THE CITY ENGINEER OR HIS DESIGNATED REPRESENTATIVE IN A TIMELY FASHION. CONTRACTOR WILL COORDINATE AND FACILITATE THE DUTIES OF THE CITY'S DESIGNATED REPRESENTATIVE DURING CONSTRUCTION.
- THE CONTRACTOR SHALL REVIEW AND VERIFY ALL DIMENSIONS SHOWN ON THE PLANS AND ALL FIELD CONDITIONS THAT MAY AFFECT CONSTRUCTION SHOULD DISCREPANCIES OCCUR, THE CONTRACTOR SHALL NOTIFY THE ENGINEER TO OBTAIN THE ENGINEER'S CLARIFICATION BEFORE COMMENCING WITH THE CONSTRUCTION.
- PROPOSED CONTOURS, SPOT ELEVATIONS, AND MAXIMUM GRADES REFLECT FINISH SURFACE.
- THE CONTRACTOR IS RESPONSIBLE FOR OBTAINING PERMITS AND APPROVALS BEFORE CONSTRUCTION BEGINS.
- CONSTRUCTION ACTIVITIES THAT RESULT IN LAND DISTURBANCE OF EQUAL TO OR GREATER THAN ONE (1) ACRE, OR LESS THAN ONE (1) ACRE IF THEY ARE PART OF A LARGER COMMON PLAN OF DEVELOPMENT OR SALE THAT TOTALS AT LEAST ONE (1) ACRE MUST ALSO OBTAIN A PERMIT FROM ODEQ (FROM 605-002a) FOR STORM WATER DISCHARGED FROM CONSTRUCTION ACTIVITIES.
- THE CONTRACTOR SHALL MAINTAIN ADEQUATE SITE DRAINAGE DURING ALL PHASES OF CONSTRUCTION. THE CONTRACTOR SHALL USE SILT FENCES (OR OTHER METHODS APPROVED BY THE ENGINEER AND CITY) AS REQUIRED TO PREVENT SILT AND CONSTRUCTION DEBRIS FROM FLOWING ONTO ADJACENT PROPERTIES. CONTRACTOR SHALL COMPLY WITH ALL APPLICABLE FEDERAL, STATE, OR LOCAL EROSION, CONSERVATION, AND SILTATION ORDINANCES. CONTRACTOR SHALL INSTALL ALL TEMPORARY EROSION CONTROL DEVICES. CONTRACTOR SHALL REMOVE ALL TEMPORARY EROSION CONTROL DEVICES UPON COMPLETION OF CONSTRUCTION.
- THE CONTRACTOR SHALL TAKE ALL AVAILABLE PRECAUTIONS TO CONTROL DUST. CONTRACTOR SHALL CONTROL DUST BY SPRINKLING WATER, OR BY OTHER MEANS APPROVED BY THE CITY AND ENGINEER, AT NO ADDITIONAL COST TO THE OWNER.
- A COPY OF THE EROSION CONTROL PLAN MUST BE ON SITE AT ALL TIMES AND MADE AVAILABLE TO THE INSPECTOR UPON REQUEST.
- ALL EXCAVATING IS UNCLASSIFIED AND SHALL INCLUDE ALL MATERIALS ENCOUNTERED. UNUSABLE EXCAVATED MATERIAL AND ALL WASTE RESULTING FROM SITE CLEARING AND GRUBBING SHALL BE DISPOSED OF OFF SITE BY THE GRADING CONTRACTOR AT HIS EXPENSE.
- ALL SIGNS, PAVEMENT MARKINGS, AND OTHER TRAFFIC CONTROL DEVICES SHALL CONFORM TO THE LATEST EDITION OF THE "MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES".
- ALL EXISTING TRAFFIC AND STREET SIGNS DISTURBED DURING CONSTRUCTION SHALL BE REINSTALLED WHERE APPLICABLE BY THE CONTRACTOR.
- CONTRACTOR SHALL BE RESPONSIBLE FOR LOCATING ALL EXISTING STRUCTURES, UTILITIES AND SERVICES PRIOR TO EXCAVATION AND CONSTRUCTION.
- CONTRACTOR SHALL BE RESPONSIBLE FOR COORDINATING WITH UTILITY COMPANIES FOR THE RELOCATION OF ANY EXISTING UTILITY CONDUITS WITHIN RIGHT-OF-WAY, AND/OR EASEMENTS.
- THE CONTRACTOR SHALL PROTECT ALL EXISTING STRUCTURES, UTILITIES, AND OTHER FACILITIES TO REMAIN AND SHALL REPAIR ANY DAMAGES DUE TO HIS CONSTRUCTION ACTIVITIES AT NO COST TO THE OWNER.

- THESE PLANS, PREPARED BY KIMLEY-HORN AND ASSOCIATES, DO NOT EXTEND TO OR INCLUDE DESIGNS OR SYSTEMS PERTAINING TO THE SAFETY OF THE CONSTRUCTION CONTRACTOR OR ITS EMPLOYEES, AGENTS OR REPRESENTATIVES IN THE PERFORMANCE OF THE WORK. THE SEAL OF HEREON DOES NOT EXTEND TO ANY SUCH SAFETY SYSTEM THAT MAY NOW OR HEREAFTER BE INCORPORATED IN THESE PLANS. THE CONSTRUCTION CONTRACTOR SHALL PREPARE OR OBTAIN THE APPROPRIATE SAFETY SYSTEMS REQUIRED.
- ALL EXISTING UTILITIES SHOWN ARE LOCATED ACCORDING TO THE INFORMATION AVAILABLE TO THE ENGINEER AT THE TIME THE DRAWINGS WERE PREPARED AND HAVE NOT BEEN INDEPENDENTLY VERIFIED BY THE OWNER OR THE ENGINEER. GUARANTEE IS NOT MADE THAT ALL EXISTING UNDERGROUND UTILITIES ARE SHOWN OR THAT THE LOCATION OF THOSE SHOWN ARE ACCURATE. THE LOCATIONS SHOWN ARE FOR BIDDING PURPOSES ONLY. FINDING THE ACTUAL LOCATION OF ANY EXISTING UTILITIES IS THE CONTRACTORS RESPONSIBILITY AND SHALL BE DONE BEFORE HE COMMENCES ANY WORK IN THE VICINITY. FURTHERMORE, THE CONTRACTOR SHALL BE FULLY RESPONSIBLE FOR ANY AND ALL DAMAGES DUE TO THE CONTRACTORS FAILURE TO EXACTLY LOCATE AND PRESERVE ANY AND ALL UNDERGROUND UTILITIES. THE OWNER OR ENGINEER WILL ASSUME NO LIABILITY FOR ANY DAMAGES SUSTAINED OR COST INCURRED BECAUSE OF THE OPERATIONS IN THE VICINITY OF EXISTING UTILITIES OR STRUCTURES, NOR FOR TEMPORARY BRACING AND SHORING OF SAME. IF IT IS NECESSARY TO SHORE, BRACE, SWING OR RELOCATE A UTILITY, THE UTILITY COMPANY OR DEPARTMENT AFFECTED SHALL BE CONTACTED BY THE CONTRACTOR AND THEIR PERMISSION OBTAINED REGARDING THE METHOD TO USE FOR SUCH WORK.
- IT IS THE CONTRACTOR'S RESPONSIBILITY TO CONTACT THE VARIOUS UTILITY COMPANIES WHICH MAY HAVE BURIED OR AERIAL UTILITIES WITHIN OR NEAR THE CONSTRUCTION AREA BEFORE COMMENCING WORK. THE CONTRACTOR SHALL PROVIDE 72 HOURS MINIMUM NOTICE TO ALL UTILITY COMPANIES PRIOR TO BEGINNING CONSTRUCTION. A LIST OF THE UTILITY COMPANIES WHICH THE CONTRACTOR MUST CALL BEFORE COMMENCING WORK IS PROVIDED ON THE COVER SHEET OF THESE CONSTRUCTION PLANS. THIS LIST SERVES AS A GUIDE ONLY AND IS NOT INTENDED TO LIMIT THE UTILITY COMPANIES WHICH THE CONTRACTOR MAY WISH TO NOTIFY.
- ANY DISCREPANCIES ON THE DRAWINGS SHALL BE IMMEDIATELY BROUGHT TO THE ATTENTION OF THE OWNER & ENGINEER BEFORE COMMENCING WORK. NO FIELD CHANGES OR DEVIATIONS FROM DESIGN ARE TO BE MADE WITHOUT PRIOR APPROVAL OF THE OWNER AND NOTIFICATION TO THE ENGINEER. NO CONSIDERATION WILL BE GIVEN TO CHANGE ORDERS FOR WHICH THE OWNER AND ENGINEER WERE NOT CONTACTED PRIOR TO CONSTRUCTION OF THE AFFECTED ITEM.
- CONTRACTOR SHALL VERIFY BENCHMARKS AND DATUMS PRIOR TO COMMENCING CONSTRUCTION OR STAKING OF IMPROVEMENTS.
- THE CONTRACTOR IS RESPONSIBLE FOR COORDINATING RELOCATIONS AND INSTALLATIONS OF FRANCHISE UTILITIES NECESSARY FOR ON AND OFF SITE CONSTRUCTION.
- TRAFFIC CONTROL ON ALL CITY RIGHTS-OF-WAY SHALL MEET THE REQUIREMENTS OF THE MANUAL OF UNIFORM TRAFFIC CONTROL DEVICES (U.S. DOT/FHA) AND THE REQUIREMENTS OF THE STATE AND ANY LOCAL AGENCY HAVING JURISDICTION. IN THE EVENT THAT THE CONTRACT DOCUMENTS AND THE JURISDICTIONAL AGENCY REQUIREMENTS ARE NOT IN AGREEMENT, THE MOST STRINGENT SHALL GOVERN.
- CONTRACTOR ADJUSTMENT TO SPOT GRADES TO MAINTAIN POSITIVE DRAINAGE IS ALLOWED, WITH APPROVAL OF THE ENGINEER. CONTRACTOR SHALL CONTACT THE ENGINEER PRIOR TO PAVING IF ANY AREAS OF POOR DRAINAGE ARE ENCOUNTERED.
- A WORK ZONE PERMIT MUST BE OBTAINED FROM THE TRAFFIC MANAGEMENT DIVISION AT LEAST TWO (2) WORKING DAYS PRIOR TO THE START OF WORK AND/OR PLACING OR REMOVING ANY BARRICADES OR MODIFYING EXISTING TRAFFIC CONTROL DEVICES. A WORK ZONE PERMIT MUST BE OBTAINED FROM THE TRAFFIC MANAGEMENT DIVISION AT LEAST TWO (2) WORKING DAYS PRIOR TO THE START OF WORK AND/OR PLACING OR REMOVING ANY BARRICADES OR MODIFYING EXISTING TRAFFIC CONTROL DEVICES. EMAIL WORKZONES@OKC.GOV TO OBTAIN AN APPLICATION.
- THE CONTRACTOR IS RESPONSIBLE FOR THE PROMPT REPLACEMENT AND/OR REPAIR OF ALL EROSION CONTROL DEVICES AND APPURTENANCES DAMAGED OR DISTURBED DUE TO CONSTRUCTION.
- THE CONTRACTOR IS RESPONSIBLE FOR THE REMOVAL OF ALL PAVEMENT MARKINGS THAT WILL BE IN CONFLICT WITH THE PROPOSED WORK.
- THE USGS 7.5 MINUTES QUADRANGLE SHEETS INDICATE THAT "WATERS OF THE UNITED STATES" AND "WETLANDS" EXIST WITHIN THIS PROJECT AREA. THE ISSUE OF "WATERS OF THE UNITED STATES" AND "WETLANDS" FALLS UNDER THE CORP OF ENGINEERS (COE) TULSA DISTRICT REGULATORY DIVISION, BUT THE CITY IS OBLIGATED TO INSURE THAT ALL NECESSARY STATE AND FEDERAL PERMITS HAVE BEEN OBTAINED, PURSUIT TO 44 CFR 60.3. THEREFORE, THE APPLICANT IS REQUIRED TO SUBMIT DOCUMENTATION FROM THE COE SHOWING COE APPROVAL FOR THE PROPOSED WORK.
- THE CONTRACTOR SHALL BE RESPONSIBLE FOR ALL THE REPAIR OR REPLACEMENT OF ALL EROSION

CONTROL DEVICES DAMAGED DUE TO CONSTRUCTION.

NOTES:

- CITY SHALL PROVIDE TRAFFIC CONTROL IN COMPLIANCE WITH THE LATEST EDITION OF THE MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES AND THE CITY OF OKLAHOMA CITY STANDARDS.
- CITY SHALL FURNISH AND INSTALL ALL PROPOSED THERMOPLASTIC PAVEMENT MARKINGS.
- THERMOPLASTIC PAVEMENT MARKINGS SHALL NE PLACED IN ACCORDANCE WITH THE CITY OF OKLAHOMA CITY STANDARDS. DIMENSIONS SHALL BE FROM FACE OF CURB TO THE CENTER OF THE STRIPE OF MARKING.
- EXISTING PAVEMENT MARKINGS ARE SHOWN AND TO REMAIN, EXCEPT THAT CITY FORCES SHALL REMOVE ALL PAVEMENT MARKINGS THAT CONFLICT WITH THE PROPOSED MARKINGS.
- PAVEMENT MARKINGS SHALL BE INSTALLED IN COMPLIANCE WITH THE LATEST VERSION OF THE MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES.
- PAVEMENT SURFACE PREPARATION FOR THE PAVEMENT MARKINGS SHALL BE CONSIDERED SUBSIDIARY TO THE RESPECTIVE BID ITEM.
- SIGN LOCATIONS SHOWN IN PLANS ARE APPROXIMATE. CITY SHALL FIELD VERIFY SIGN LOCATIONS AND RECEIVE APPROVAL FROM THE CITY OF OKLAHOMA CITY ENGINEERING STAFF FOR PROPOSED SIGN LOCATIONS.
- ALL MATERIAL SHALL MEET ODOT MATERIAL SPECIFICATION. TESTING OF PAVEMENT MARKINGS AND MARKERS SHALL BE IN ACCORDANCE WITH ODOT TEXT PROCEDURES.

Kimley»Horn

FIRM No. 2740
14101 Wireless Way Bldg. A Ste. 150 Oklahoma City, OK 73134

P-005-241-54P3

No.

By

Date

PRELIMINARY

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Kimley»Horn

Engineer: LYDIA M. LESLIE
P.E. No. 19432 Date: 4/2022

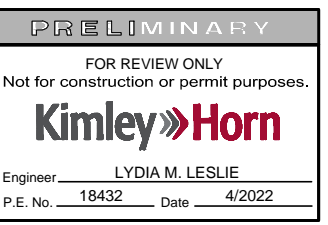
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CLASSEN
STREETSCAPE
OKLAHOMA CITY, OKLAHOMA

GENERAL NOTES

DATE:	February 7, 2022	LML
DESIGN:		KBY
DRAWN:		LML
CHECKED:		
KHA NO.:	061292806	

SHEET

C 0.01



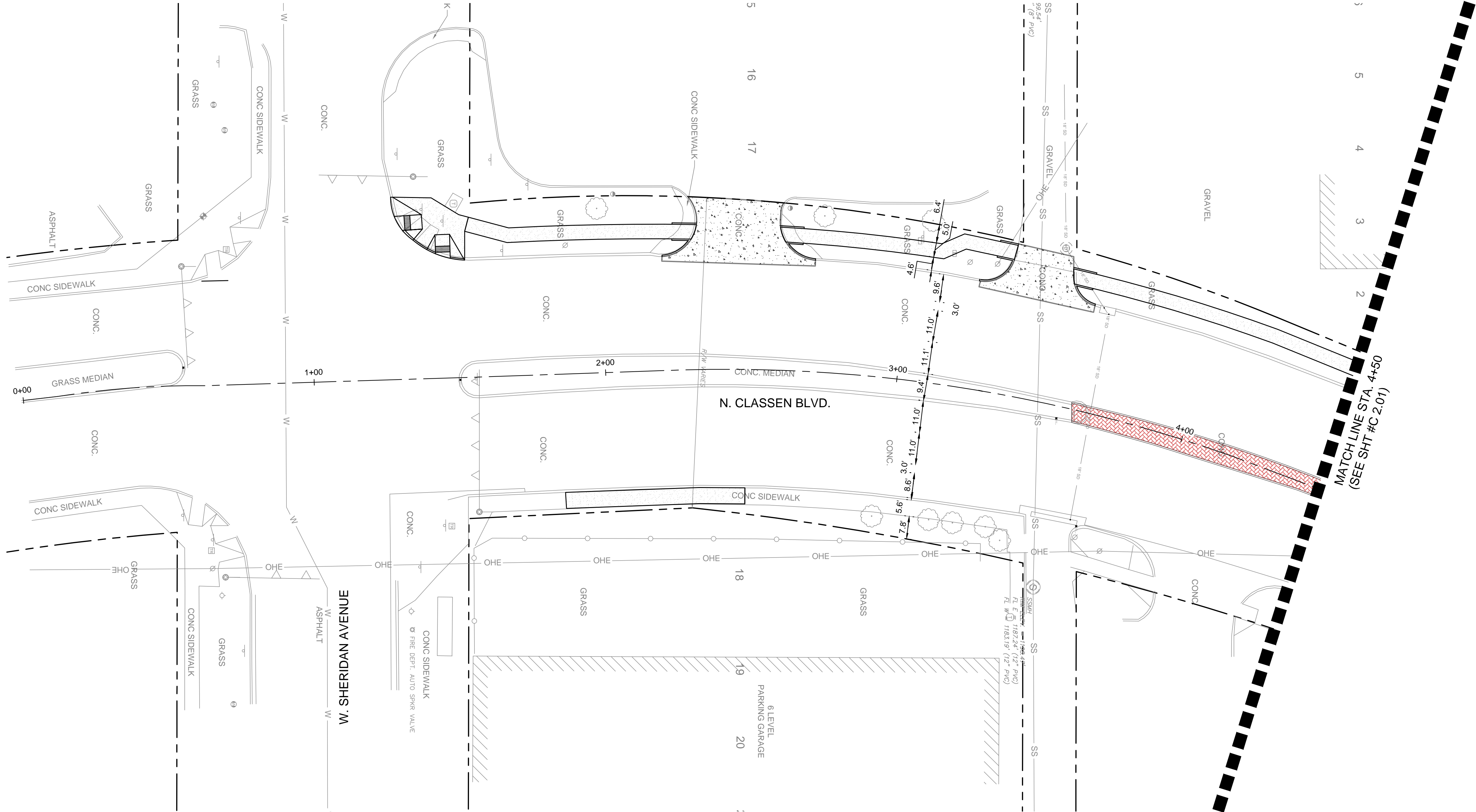
PC-0701 AND PC-0729
CLASSEN
STREETSCAPE
OKLAHOMA CITY, OKLAHOMA

OVERALL MAP

DATE:	September 17, 2020
DESIGN:	LML
DRAWN:	KBY
CHECKED:	LML
KHA NO.:	061292806

SHEET

C 0.02



LEGEND

	PROPERTY LINE
	CONCRETE PAVEMENT
	CONCRETE SIDEWALK
	STAMPED CONCRETE
	ADD ALTERNATE #1
	TACTILE WARNING STRIPS
	NEW LIGHT FIXTURES

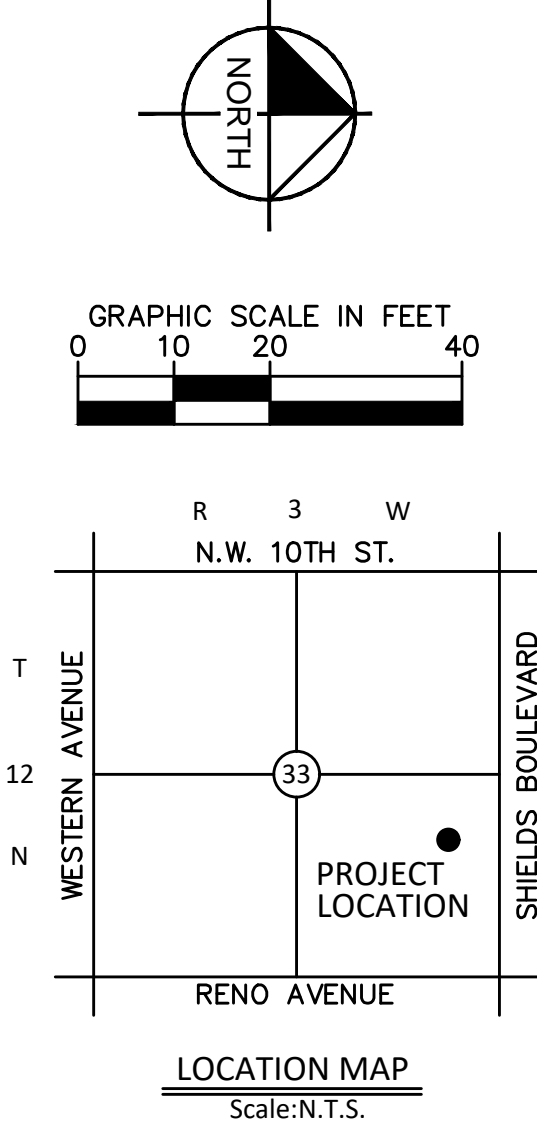
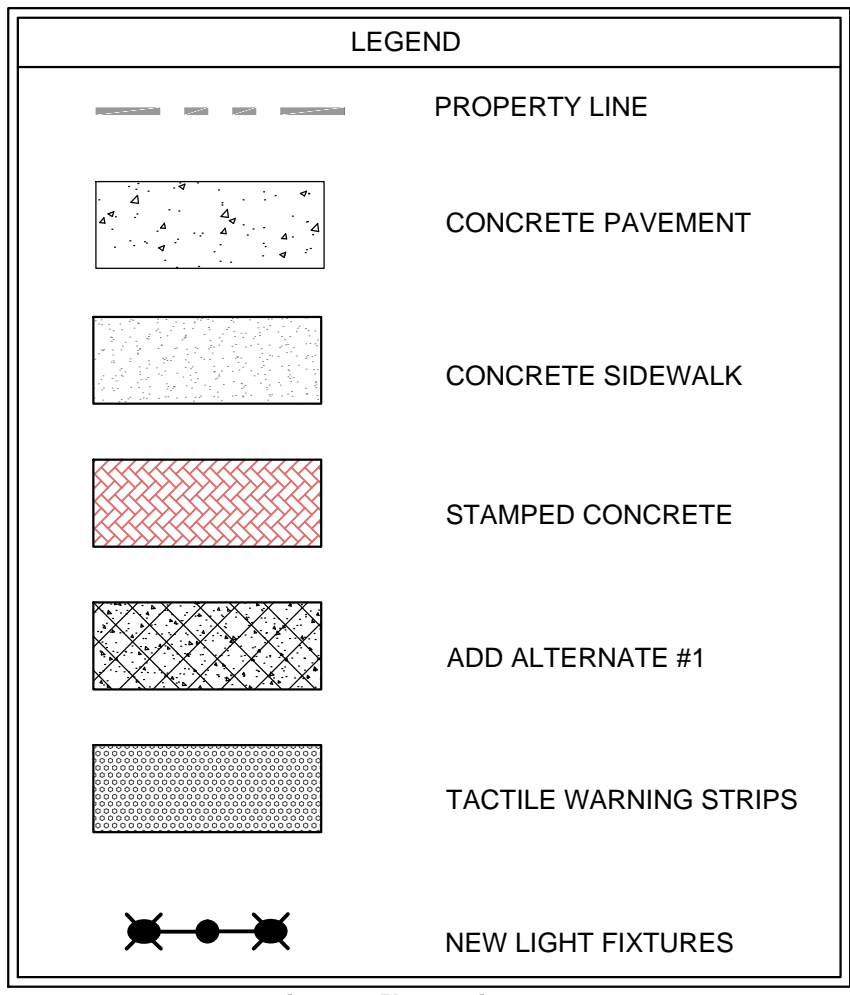
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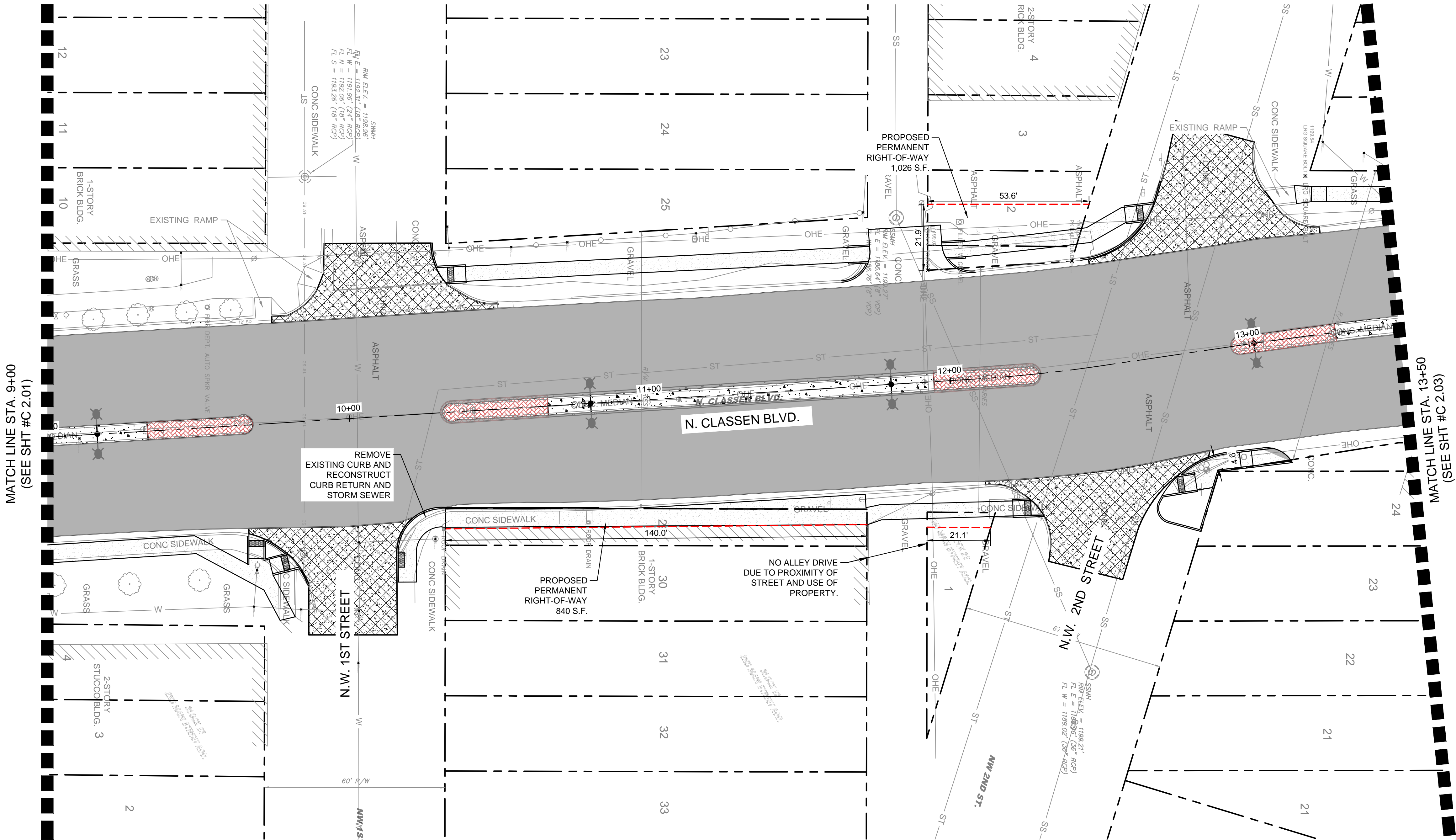
LOCATION MAP
Scale: N.T.S.

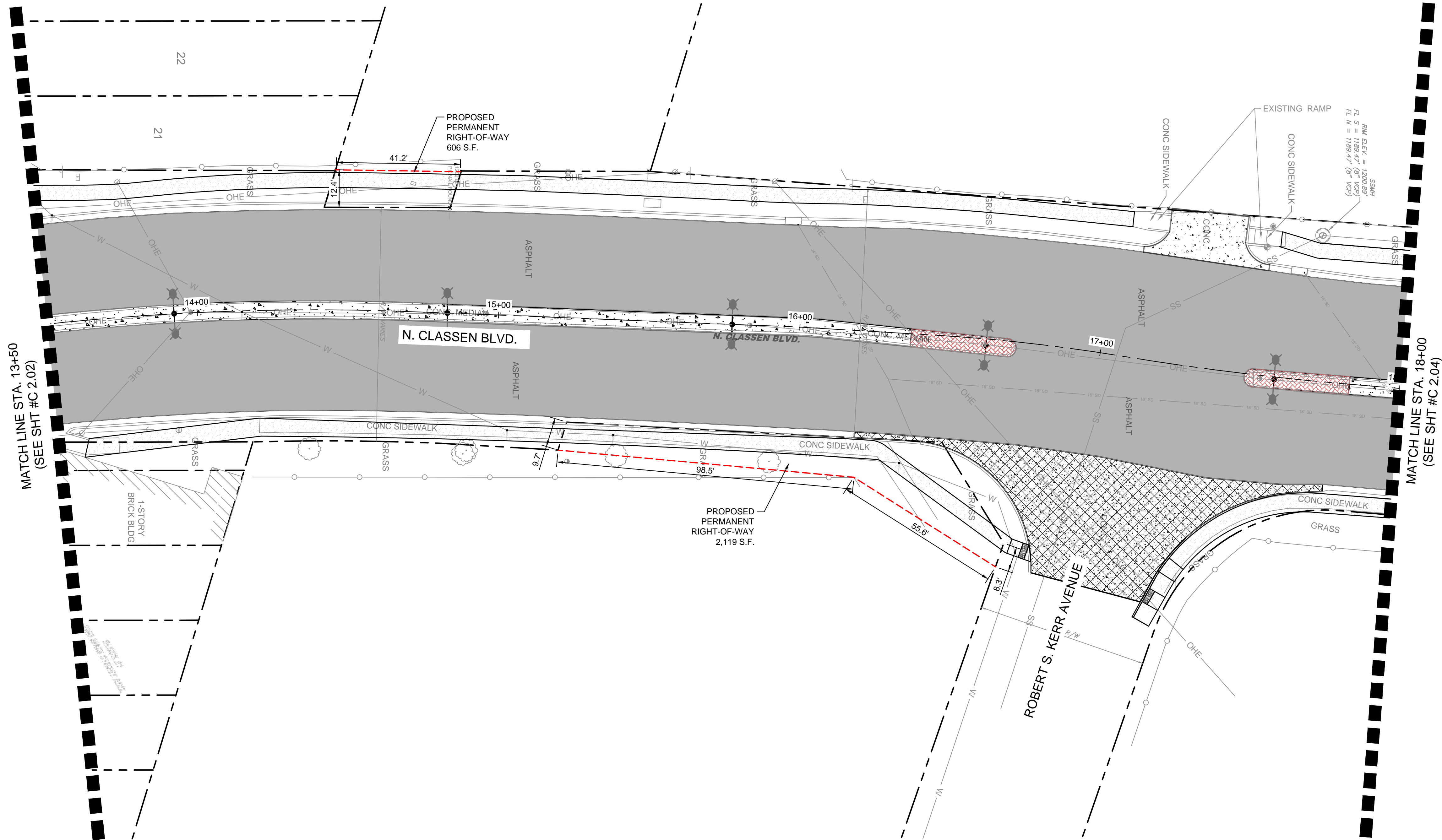
Western Avenue
N.W. 10TH ST.
Shields Boulevard
Reno Avenue
Project Location

North Arrow
NORTH

Kimley»Horn FIRM No. 2740 1401 Wireless Way Bldg. A Ste. 150 Oklahoma City, OK 73134 P: 405-241-5493	No.	By	Date
	Revision		
PRELIMINARY FOR REVIEW ONLY Not for construction or permit purposes. Kimley»Horn Engineer: LYDIA M. LESLIE P.E. No. 18432 Date: 4/2022	PC-0701 AND PC-0729 CLASSEN STREETSCAPE OKLAHOMA CITY, OKLAHOMA		
DATE: April 27, 2022	DESIGN: LML	DRAWN: KBY	CHECKED: LML
SHEET			KHA NO.: 061292806
C-2.00			







LEGEND

- PROPERTY LINE
- CONCRETE PAVEMENT
- CONCRETE SIDEWALK
- STAMPED CONCRETE
- ADD ALTERNATE #1
- TACTILE WARNING STRIPS
- NEW LIGHT FIXTURES

GRAPHIC SCALE IN FEET
0 10 20 40

LOCATION MAP
Scale: N.T.S.

WESTERN AVENUE
N.W. 10TH ST.
SHIELDS BOULEVARD
RENO AVENUE
PROJECT LOCATION

DATE: April 27, 2022		DESIGN: LML		DRAWN: KBY		CHECKED: LML		KHA NO.: 061292806	
SHEET									
C 2.03									

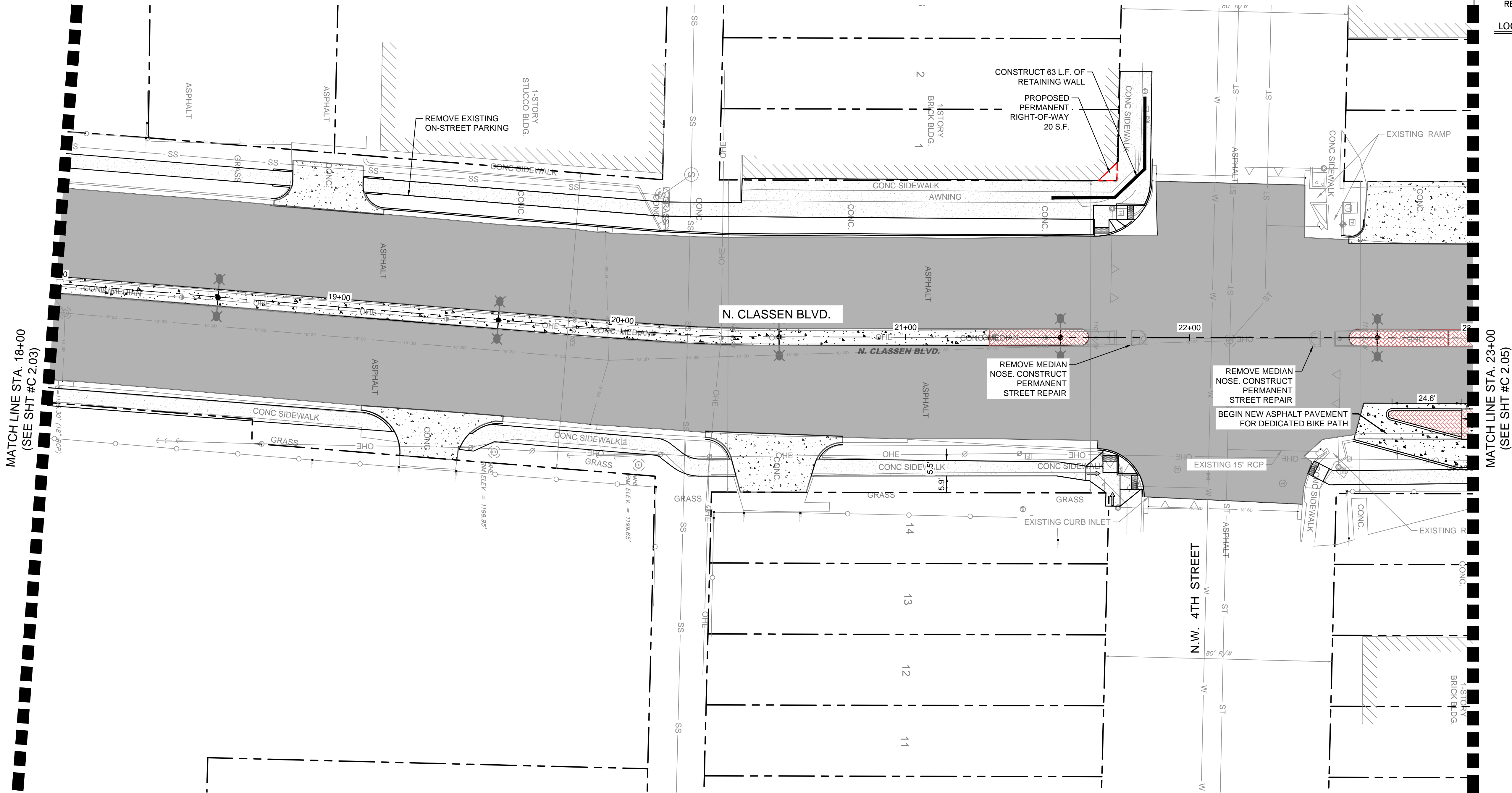
PC-0701 AND PC-0729
CLASSEN
STREETSCAPE
OKLAHOMA CITY, OKLAHOMA

PAVEMENT
IMPROVEMENTS (4 OF 10)

Kimley»Horn
FIRM No. 2740
14101 Wireless Way Bldg. A Ste. 150 Oklahoma City, OK 73134
P.E. No. 19432
Date 8/2022

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Kimley»Horn
Engineer: LYDIA M. LESLIE
P.E. No. 19432 Date 8/2022

No.	Revision	By	Date



LEGEND

- PROPERTY LINE
- CONCRETE PAVEMENT
- CONCRETE SIDEWALK
- STAMPED CONCRETE
- ADD ALTERNATE #1
- TACTILE WARNING STRIPS
- NEW LIGHT FIXTURES

LOCATION MAP
Scale: N.T.S.

GRAPHIC SCALE IN FEET
0 10 20 40

NORTH

WESTERN AVENUE
N.W. 10TH ST.
SHIELDS BOULEVARD

PROJECT LOCATION

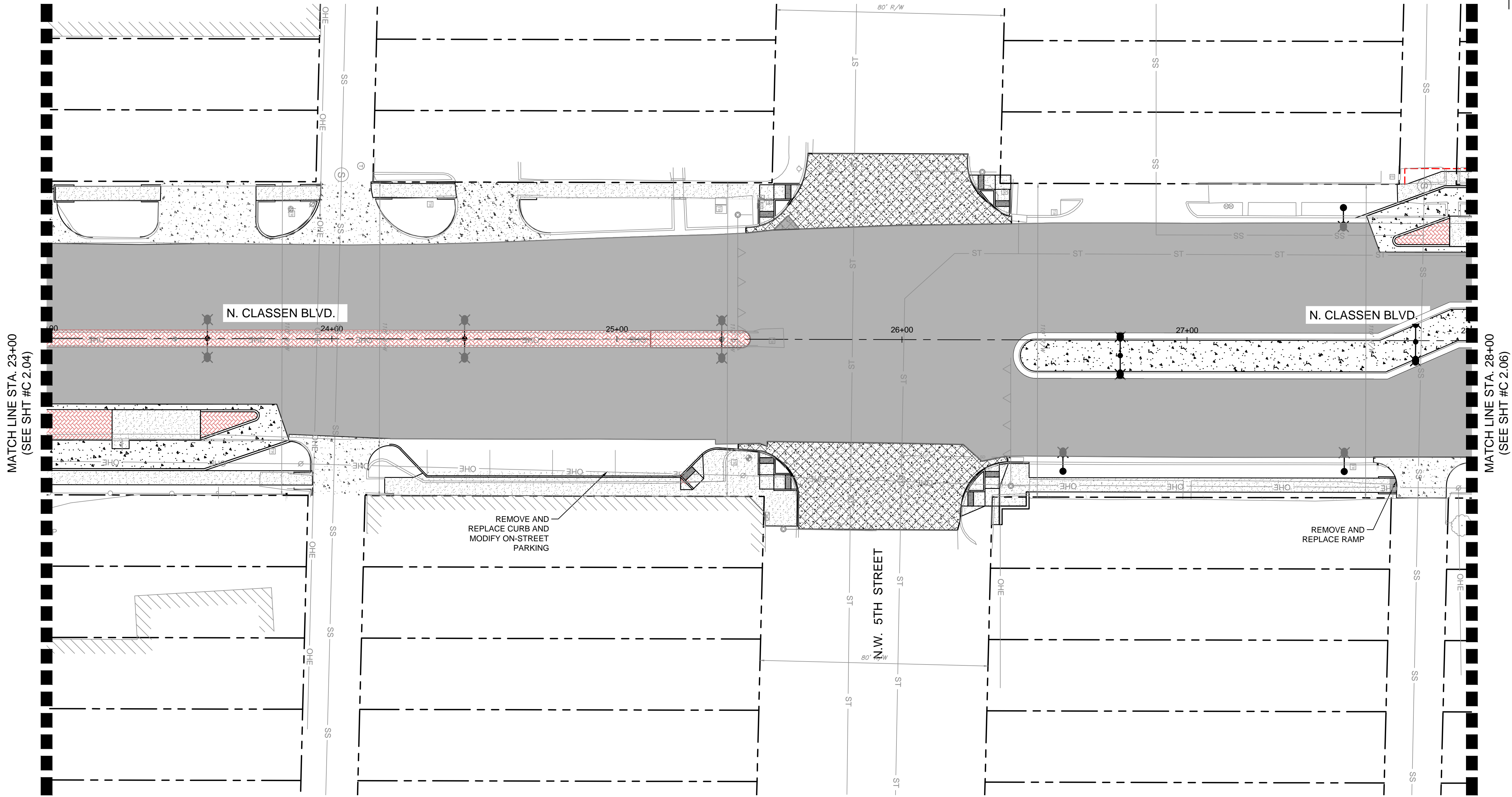
Kimley»Horn FIRM No. 2740 14101 Wireless Way Bldg. A Ste. 150 Oklahoma City, OK 73134 P: 405-241-5493 F: 405-241-5494		DATE: April 27, 2022	
No.		DESIGN: LML	
Revision		DRAWN: KBY	
By		CHECKED: LML	
Date		KHA NO.: 061292806	
SHEET			
C 2.04			

**PC-0701 AND PC-0729
CLASSEN
STREETSCAPE
OKLAHOMA CITY, OKLAHOMA**

**PAVEMENT
IMPROVEMENTS (5 OF 10)**

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Kimley»Horn
Engineer: LYDIA M. LESLIE
P.E. No. 19432 Date: 4/2022

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LEGEND

- PROPERTY LINE
- CONCRETE PAVEMENT
- CONCRETE SIDEWALK
- STAMPED CONCRETE
- ADD ALTERNATE #1
- TACTILE WARNING STRIPS
- NEW LIGHT FIXTURES

GRAPHIC SCALE IN FEET
0 10 20 40

LOCATION MAP
Scale: N.T.S.

WESTERN AVENUE
N.W. 10TH ST.
RENO AVENUE
SHIELDS BOULEVARD
PROJECT LOCATION

DATE: April 14, 2022

DESIGN: LML

DRAWN: KBY

CHECKED: LML

KHA NO.: 061292806

SHEET

C 2.05

PC-0701 AND PC-0729
CLASSEN
STREETSCAPE
OKLAHOMA CITY, OKLAHOMA

PAVEMENT
IMPROVEMENTS (6 OF 10)

Kimley»Horn
FIRM No. 2740
14101 Wireless Way Bldg. A Ste. 150 Oklahoma City, OK 73134
P.E. No. 19432
Engineer: LYDIA M. LESLIE
Date: 4/2022

Kimley»Horn
FIRM No. 2740
14101 Wireless Way Bldg. A Ste. 150 Oklahoma City, OK 73134
P.E. No. 19432
Engineer: LYDIA M. LESLIE
Date: 4/2022

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Kimley»Horn
P.E. No. 19432
Engineer: LYDIA M. LESLIE
Date: 4/2022

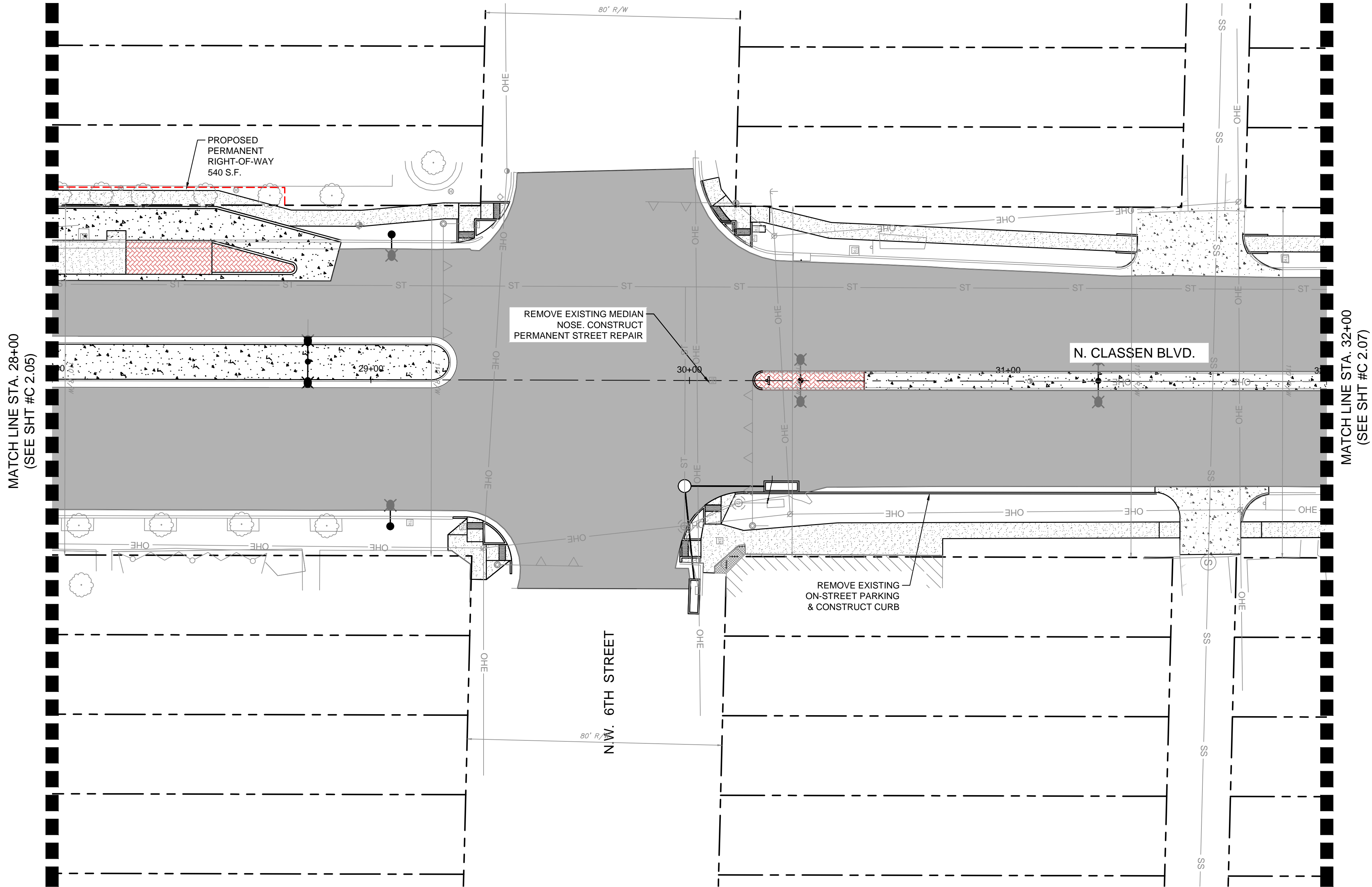
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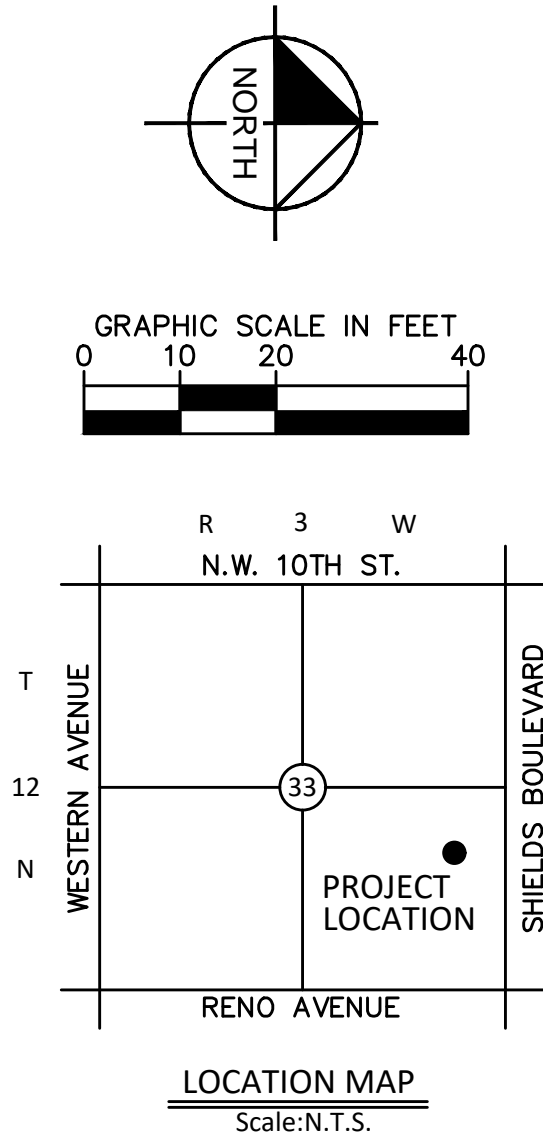
Revision

Date

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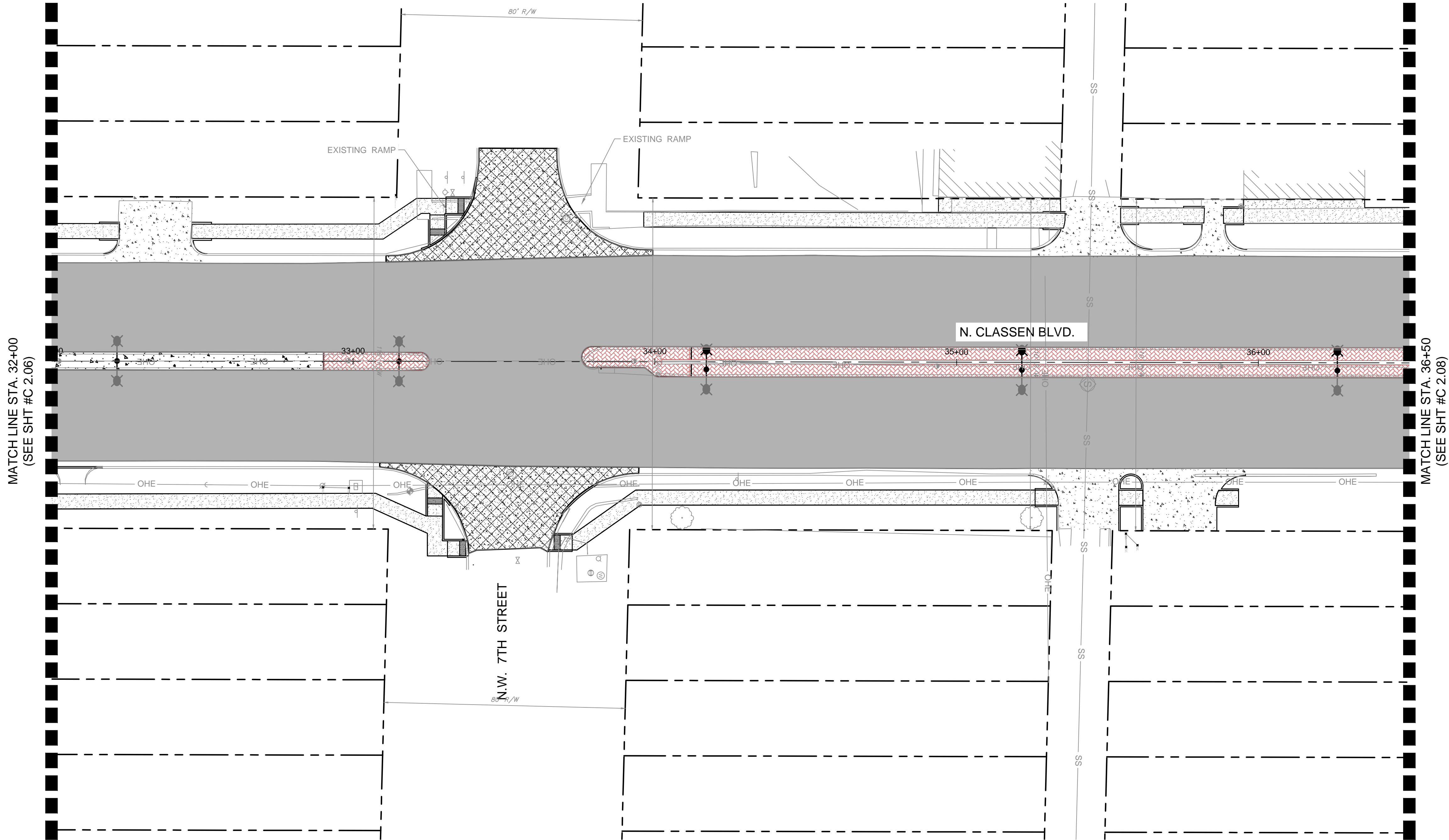


LEGEND	
	PROPERTY LINE
	CONCRETE PAVEMENT
	CONCRETE SIDEWALK
	STAMPED CONCRETE
	ADD ALTERNATE #1
	TACTILE WARNING STRIPS
	NEW LIGHT FIXTURES



Kimley»Horn FIRM No. 2740 P-005-241-5493 14101 Wireless Way Bldg. A Ste. 150 Oklahoma City, OK 73134		No. _____ Revision _____ By _____ Date _____	
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DATE: April 14, 2022 DESIGN: LML DRAWN: KBY CHECKED: LML KHA NO.: 061292806		PAVEMENT IMPROVEMENTS (7 OF 10)	
SHEET		C 2.06	

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LEGEND

PROPERTY LINE

CONCRETE PAVEMENT

CONCRETE SIDEWALK

STAMPED CONCRETE

ADD ALTERNATE #1

TACTILE WARNING STRIPS

NEW LIGHT FIXTURES

GRAPHIC SCALE IN FEET

12

33

12

WESTERN AVENUE

N.W. 10TH ST.

RENO AVENUE

PROJECT LOCATION

SHIELDS BOULEVARD

LOCATION MAP

Scale:N.T.S.

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Engineer: LYDIA M. LESLIE

P.E. No.: 19432 Date: 4/2022

PC-0701 AND PC-0729

CLASSEN

STREETSCAPE

OKLAHOMA CITY, OKLAHOMA

PAVEMENT

IMPROVEMENTS (8 OF 10)

DATE:	April 14, 2022
DESIGN:	LML
DRAWN:	KBY
CHECKED:	LML
KHA NO.:	061292806

SHEET

C 2.07

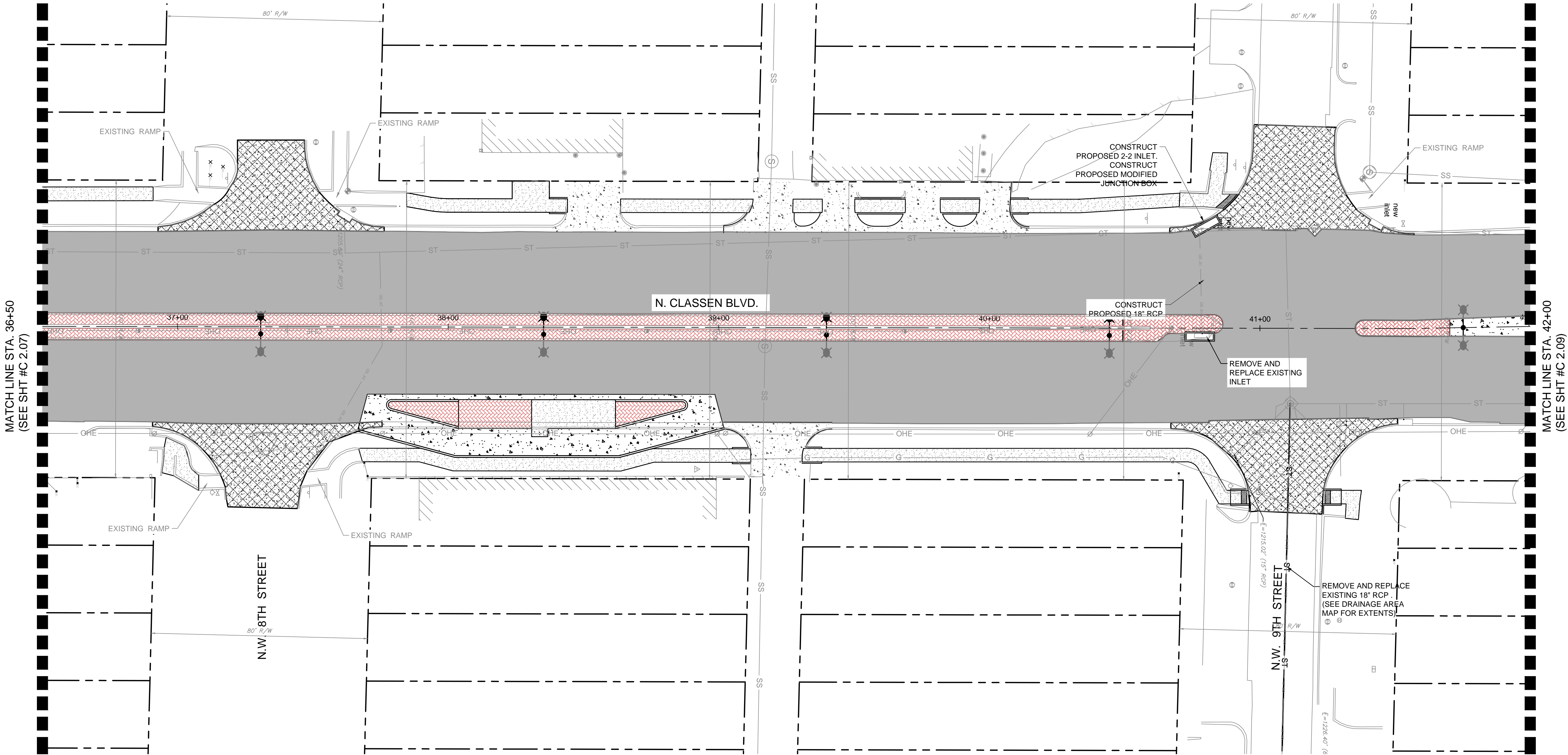
FIRM No. 2740

P-005-241-5493

14101 Wireless Way Bldg. A Ste. 150 Oklahoma City, OK 73134

No.	Revision	By	Date

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MATCH LINE STA. 36+50
(SEE SHT #C 2.07)

MATCH LINE STA. 42+00
(SEE SHT #C 2.09)

LEGEND

- PROPERTY LINE
- CONCRETE PAVEMENT
- CONCRETE SIDEWALK
- STAMPED CONCRETE
- ADD ALTERNATE #1
- TACTILE WARNING STRIPS
- NEW LIGHT FIXTURES

LOCATION MAP
Scale: N.T.S.

GRAPHIC SCALE IN FEET
0 10 20 40

NORTH

WESTERN AVENUE
N.W. 10TH ST.
SHIELDS BOULEVARD
RENO AVENUE

PROJECT LOCATION

PC-0701 AND PC-0729
CLASSEN
STREETSCAPE
OKLAHOMA CITY, OKLAHOMA

PAVEMENT
IMPROVEMENTS (9 OF 10)

DATE:	April 14, 2022
DESIGN:	LML KBY
DRAWN:	LML
CHECKED:	LML
KHA NO.:	061292806

SHEET

C 2.08

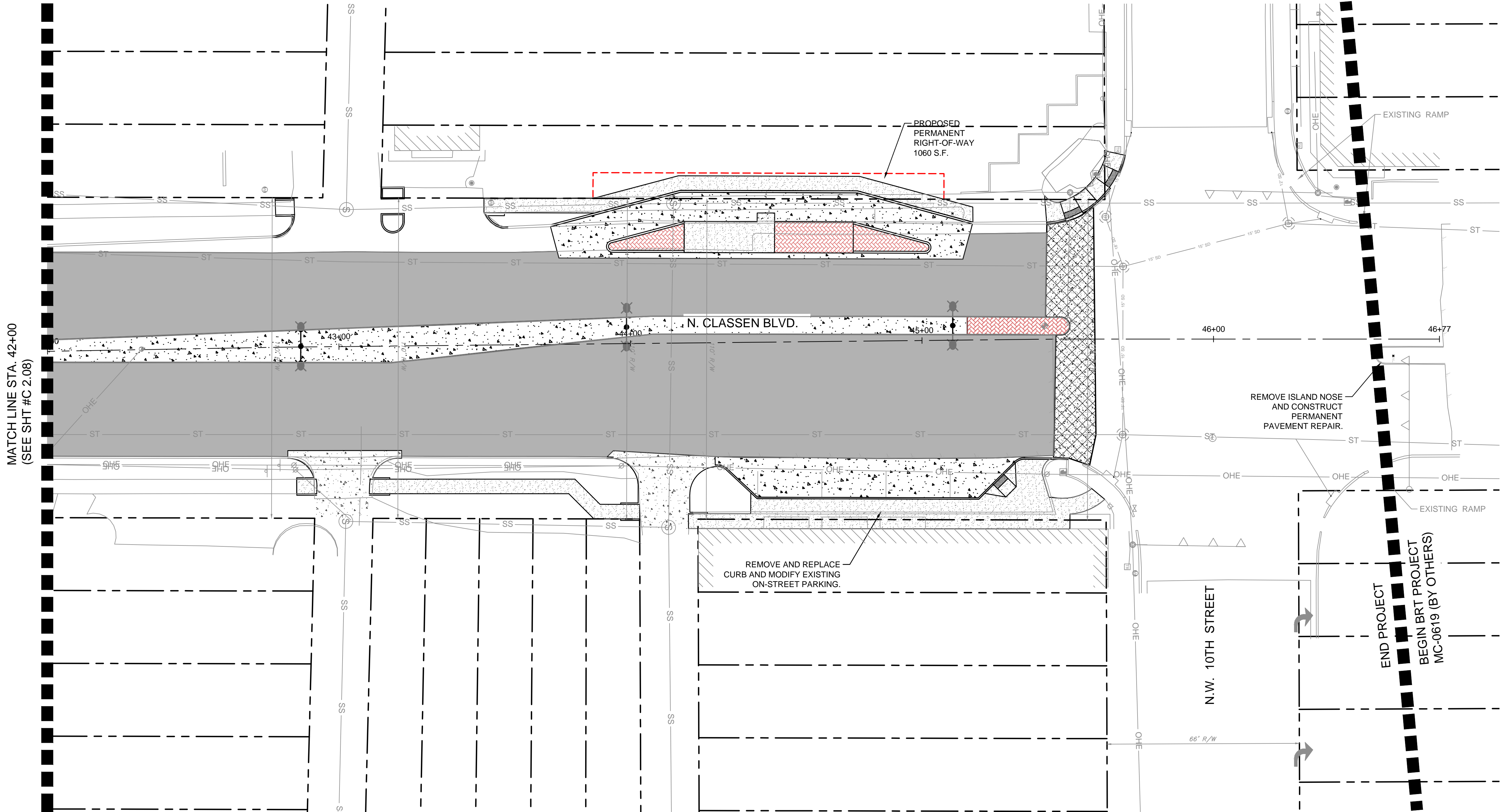
Kimley»Horn
FIRM No. 2740
1401 Wireless Way Bldg. A Ste. 150 Oklahoma City, OK 73134
P: 405-241-5493
F: 405-241-5494

No.	Revision	By	Date

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Kimley»Horn
Engineer: LYDIA M. LESLIE
P.E. No. 18432 Date: 4/2022

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LEGEND

- PROPERTY LINE
- CONCRETE PAVEMENT
- CONCRETE SIDEWALK
- STAMPED CONCRETE
- ADD ALTERNATE #1
- TACTILE WARNING STRIPS
- NEW LIGHT FIXTURES

GRAPHIC SCALE IN FEET

0 10 20 40

LOCATION MAP

Scale: N.T.S.

WESTERN AVENUE
N.W. 10TH ST.
RENO AVENUE
SHIELDS BOULEVARD

PROJECT LOCATION

Kimley»Horn

FIRM No. 2740
14101 Wireless Way Bldg. A Ste. 150 Oklahoma City, OK 73134

P: 405-241-5493

No.	Revision	By	Date

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Kimley»Horn

Engineer: LYDIA M. LESLIE
P.E. No. 19432 Date: 4/2022

PC-0701 AND PC-0729

CLASSEN

STREETSCAPE

OKLAHOMA CITY, OKLAHOMA

PAVEMENT

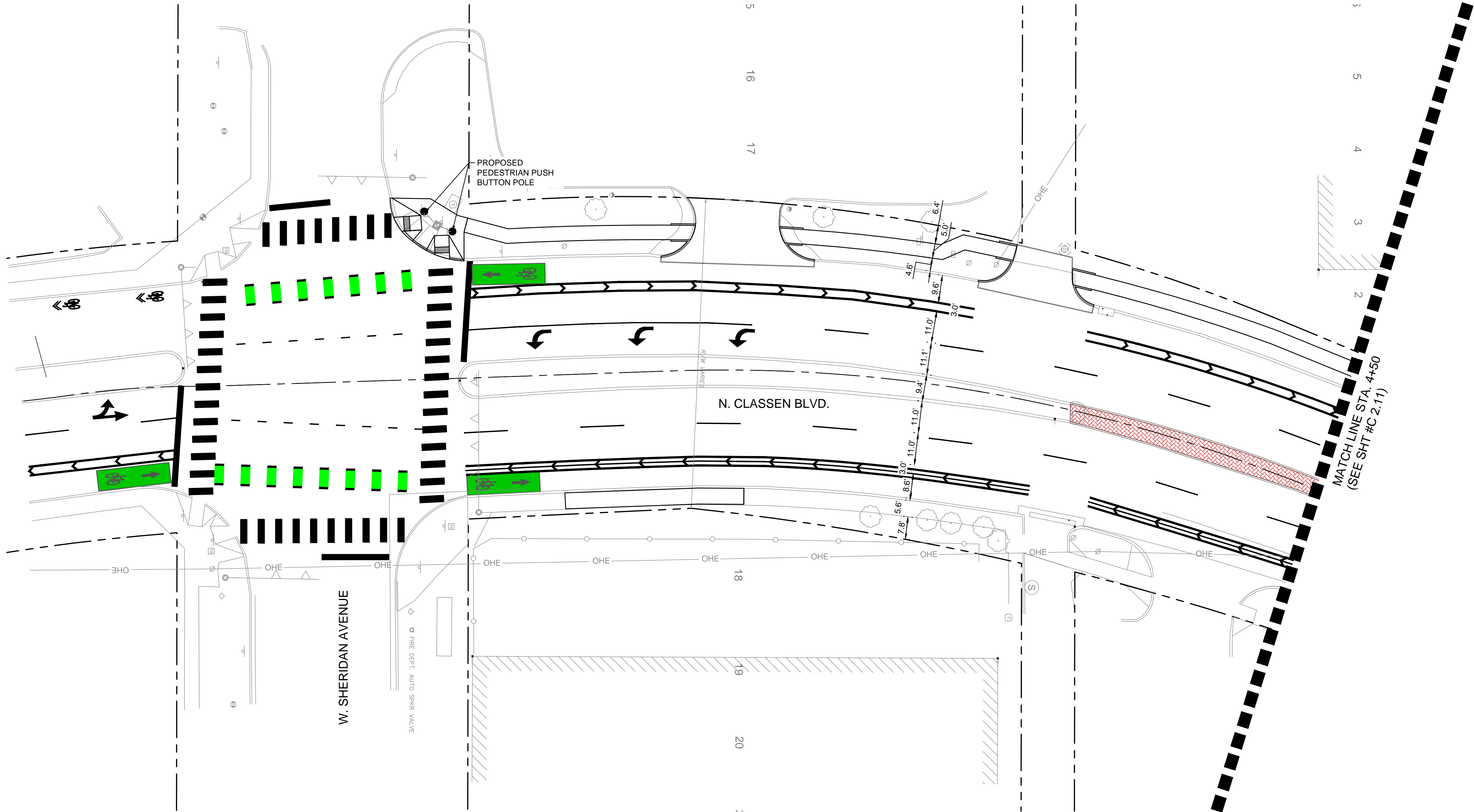
IMPROVEMENTS (10 OF 10)

DATE:	April 14, 2022
DESIGN:	LML
DRAWN:	KBY
CHECKED:	LML
KHA NO.:	061292806

SHEET

C 2.09

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LEGEND

- PROPERTY LINE
- CONCRETE PAVEMENT
- CONCRETE SIDEWALK
- STAMPED CONCRETE
- BIKE LANE PATH
- BIKE LANE PATH AT ALLEYS AND INTERSECTIONS
- BIKE LANE BUFFER

GRAPHIC SCALE IN FEET

0 10 20 40

LOCATION MAP
Scale: N.T.S.

WESTERN AVENUE
N.W. 10TH ST.
RENO AVENUE
SHIELDS BOULEVARD

PROJECT LOCATION

Kimley»Horn FIRM No. 2740 1401 Wireless Way Bldg. A Ste. 150 Oklahoma City, OK 73134 P: 405-241-5493		No.		By		Date	
Revision		Revision		Revision		Revision	

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Kimley»Horn
Engineer: LYDIA M. LESLIE
P.E. No. 18432 Date: 4/2022

**PC-0701 AND PC-0729
CLASSEN
STREETSCAPE
OKLAHOMA CITY, OKLAHOMA**

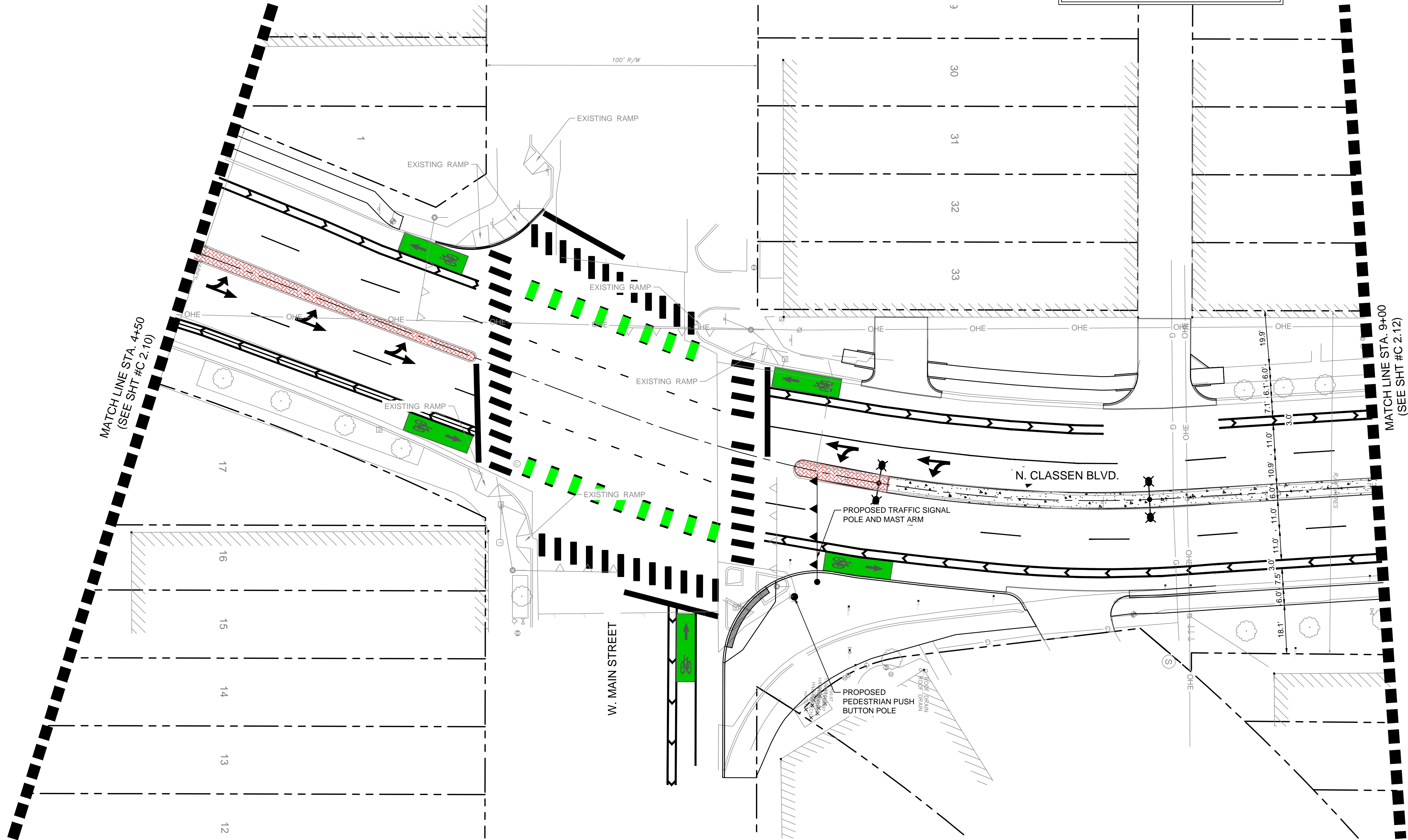
**TRAFFIC & PAVEMENT
MARKINGS (1 OF 10)**

DATE:	April 13, 2022	LML	KBY	LML	061292806
DESIGN:					
DRAWN:					
CHECKED:					
KHA NO.:					

SHEET

C 2.10

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LEGEND

- PROPERTY LINE
- CONCRETE PAVEMENT
- CONCRETE SIDEWALK
- STAMPED CONCRETE
- BIKE LANE PATH
- BIKE LANE PATH AT ALLEYS AND INTERSECTIONS
- BIKE LANE BUFFER

GRAPHIC SCALE IN FEET
0 10 20 40

LOCATION MAP
Scale: N.T.S.

WESTERN AVENUE
N.W. 10TH ST.
SHIELDS BOULEVARD
RENO AVENUE
PROJECT LOCATION

North Arrow
NORTH

Kimley»Horn FIRM No. 2740 1401 Wireless Way, Bldg. A, Ste. 150, Oklahoma City, OK 73134 P: 405-241-5423		No.		By		Date	
Revision		Revision		Revision		Revision	

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Kimley»Horn
Engineer: LYDIA M. LESLIE
P.E. No. 18432 Date: 4/2022

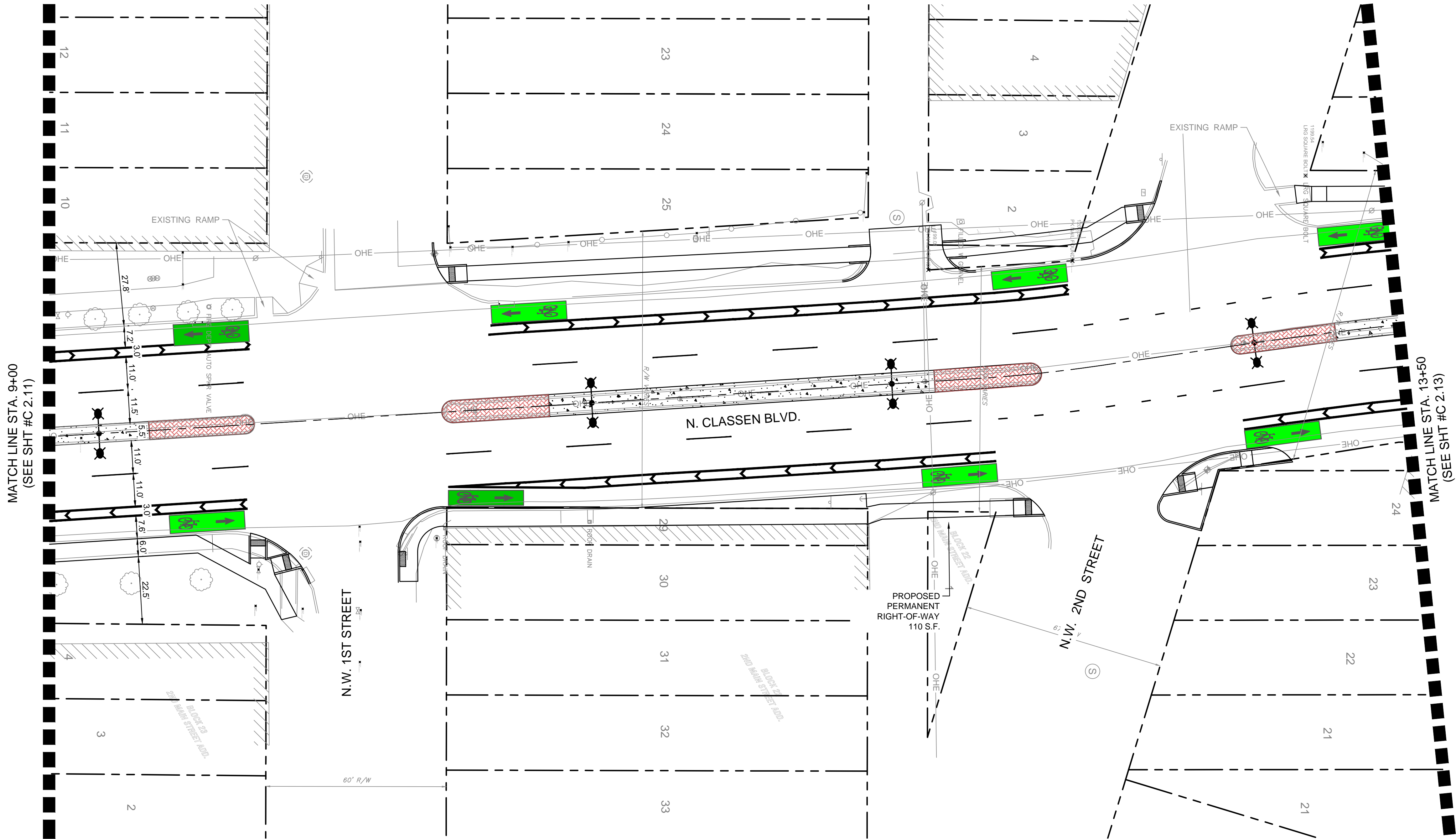
**PC-0701 AND PC-0729
CLASSEN
STREETSCAPE
OKLAHOMA CITY, OKLAHOMA**

**TRAFFIC & PAVEMENT
MARKINGS (2 OF 10)**

DATE:	April 13, 2022	LML	KBY	LML	061292806
DESIGN:					
DRAWN:					
CHECKED:					
KHA NO.:					

C 2.11

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LEGEND

- PROPERTY LINE
- CONCRETE PAVEMENT
- CONCRETE SIDEWALK
- STAMPED CONCRETE
- BIKE LANE PATH
- BIKE LANE PATH AT ALLEYS AND INTERSECTIONS
- BIKE LANE BUFFER

LOCATION MAP
Scale: N.T.S.

GRAPHIC SCALE IN FEET
0 10 20 40

NORTH

WESTERN AVENUE
N.W. 10TH ST.
RENO AVENUE
SHIELDS BOULEVARD

PROJECT LOCATION

PC-0701 AND PC-0729
CLASSEN
STREETSCAPE
OKLAHOMA CITY, OKLAHOMA

TRAFFIC & PAVEMENT
MARKINGS (3 OF 10)

DATE:	April 13, 2022
DESIGN:	LML
DRAWN:	KBY
CHECKED:	LML
KHA NO.:	061292809

C 2.12

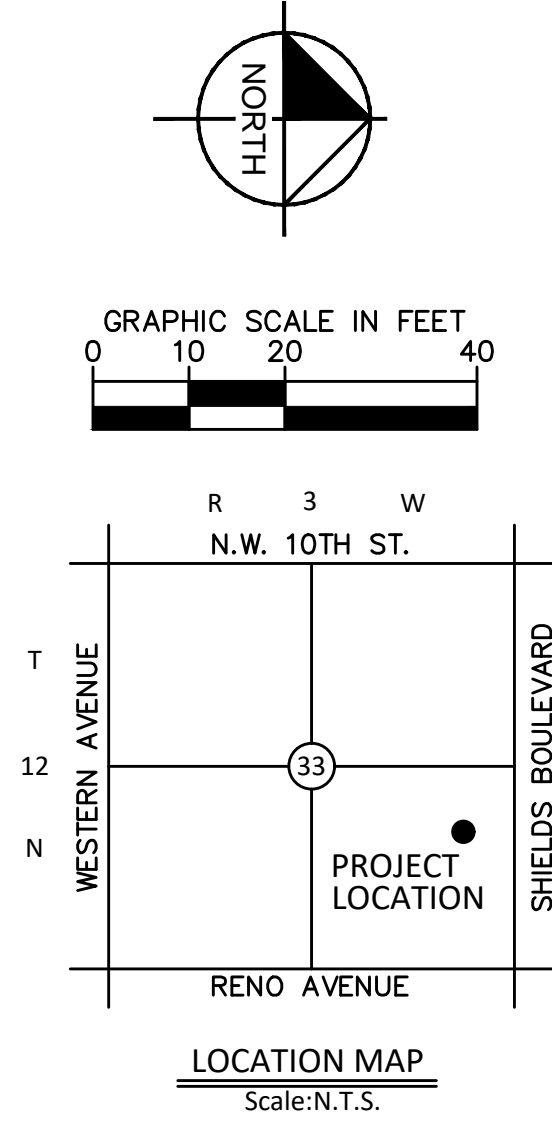
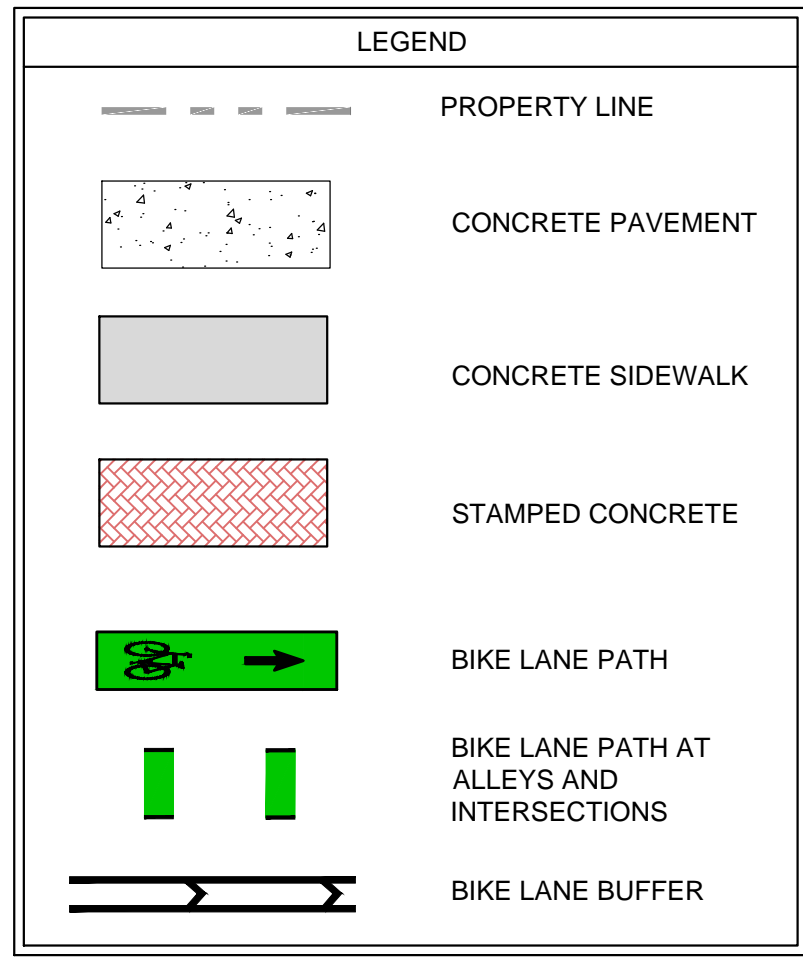
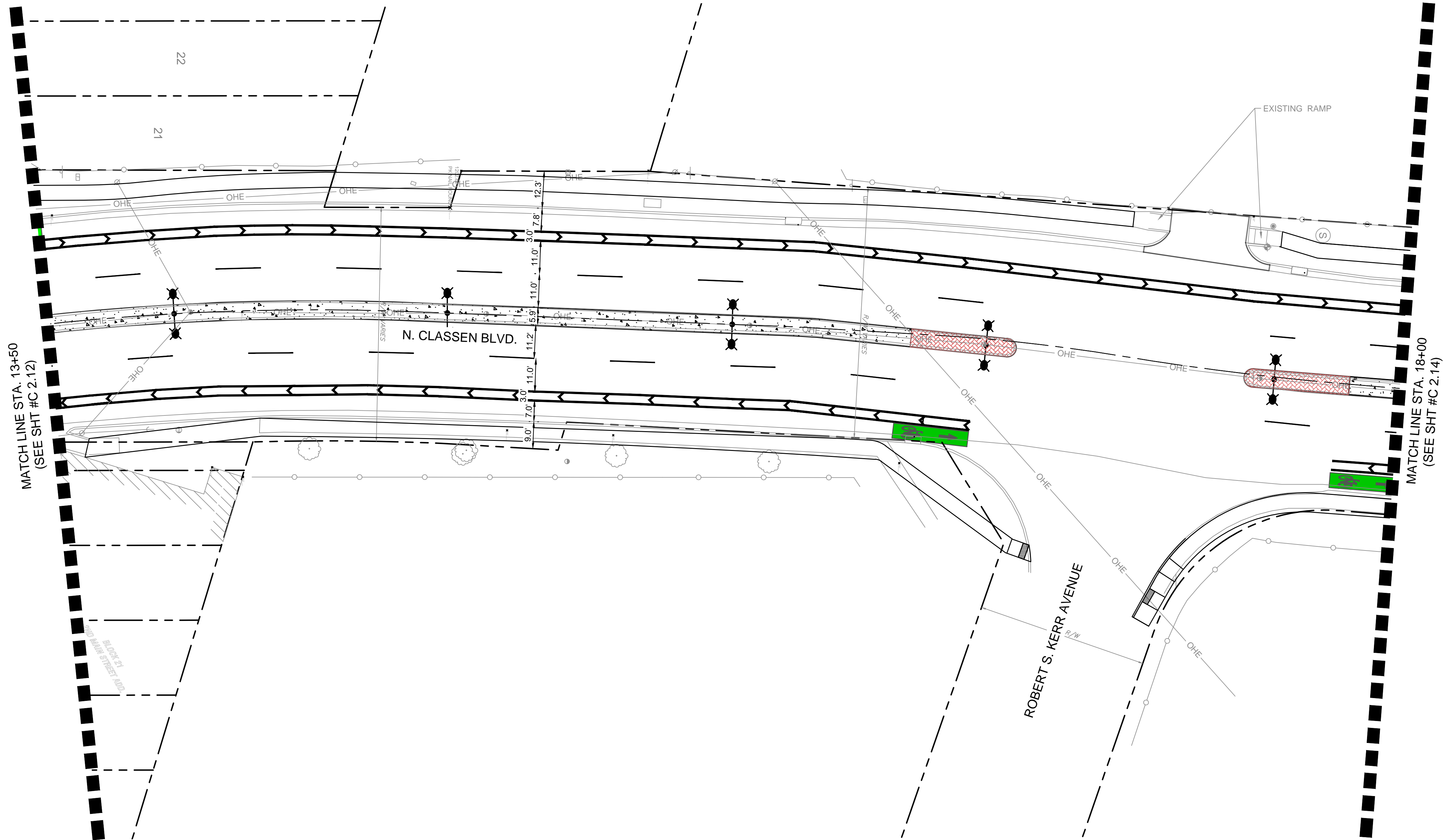
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Kimley»Horn

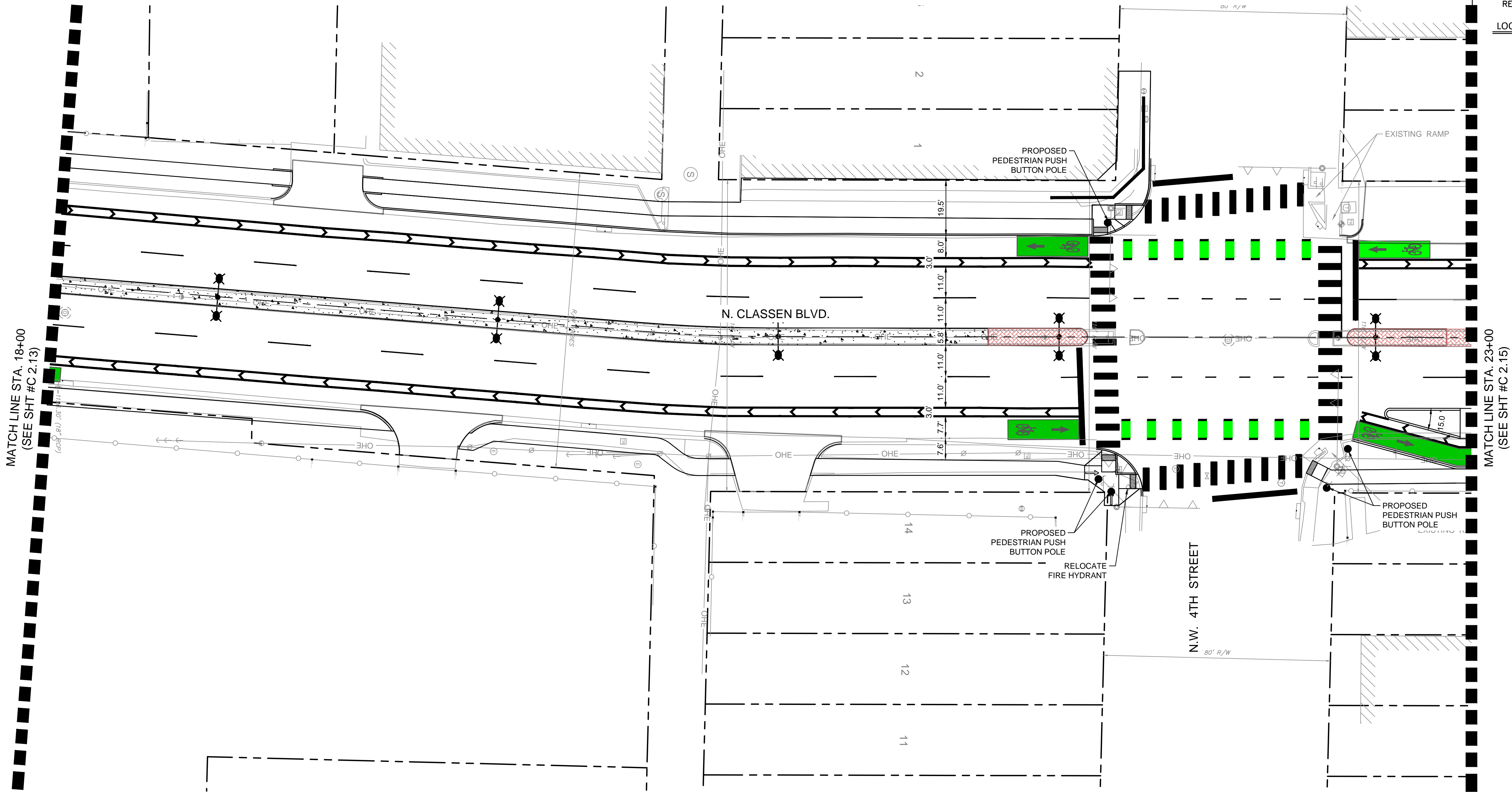
Engineer: LYDIA M. LESLIE
P.E. No. 18432 Date: 4/2022

Kimley»Horn
FIRM No. 2740
1401 Wireless Way Bldg. A Ste. 150 Oklahoma City, OK 73134
P: 405-241-5493

No.	Revision	By	Date

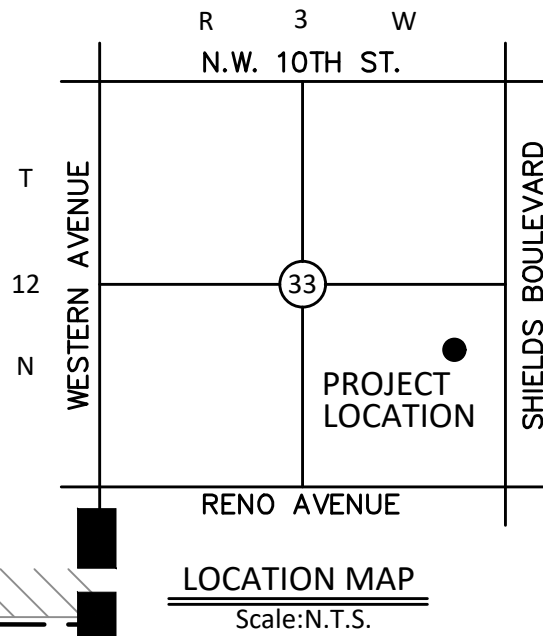
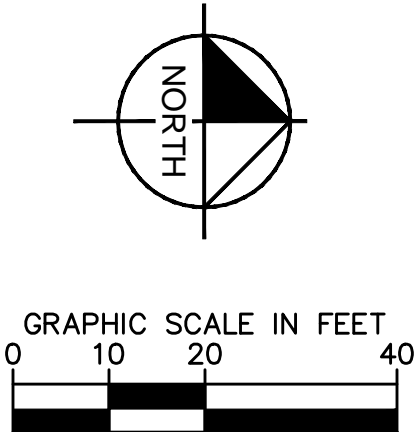


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LEGEND

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- CONCRETE PAVEMENT
- CONCRETE SIDEWALK
- STAMPED CONCRETE
- BIKE LANE PATH
- BIKE LANE PATH AT ALLEYS AND INTERSECTIONS
- BIKE LANE BUFFER



DATE: April 13, 2022

DESIGN: LML

DRAWN: KBY

CHECKED: LML

KHA NO.: 061292806

PC-0701 AND PC-0729

CLASSEN

STREETSCAPE

OKLAHOMA CITY, OKLAHOMA

TRAFFIC & PAVEMENT

MARKINGS (5 OF 10)

C 2.14

Kimley»Horn

FIRM No. 2740

14101 Wireless Way Bldg. A Ste. 150 Oklahoma City, OK 73134

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Kimley»Horn

Engineer: LYDIA M. LESLIE

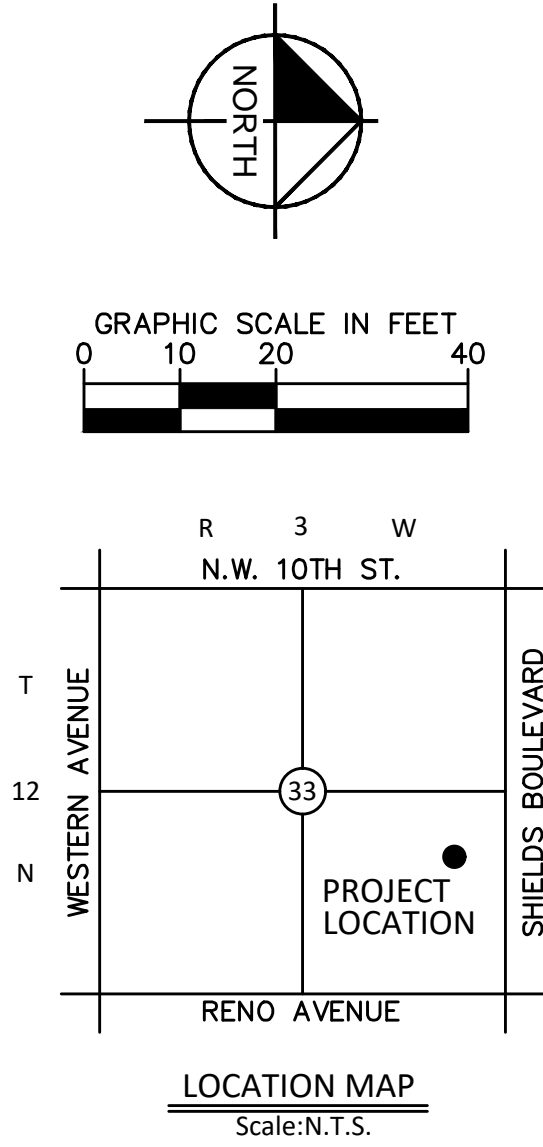
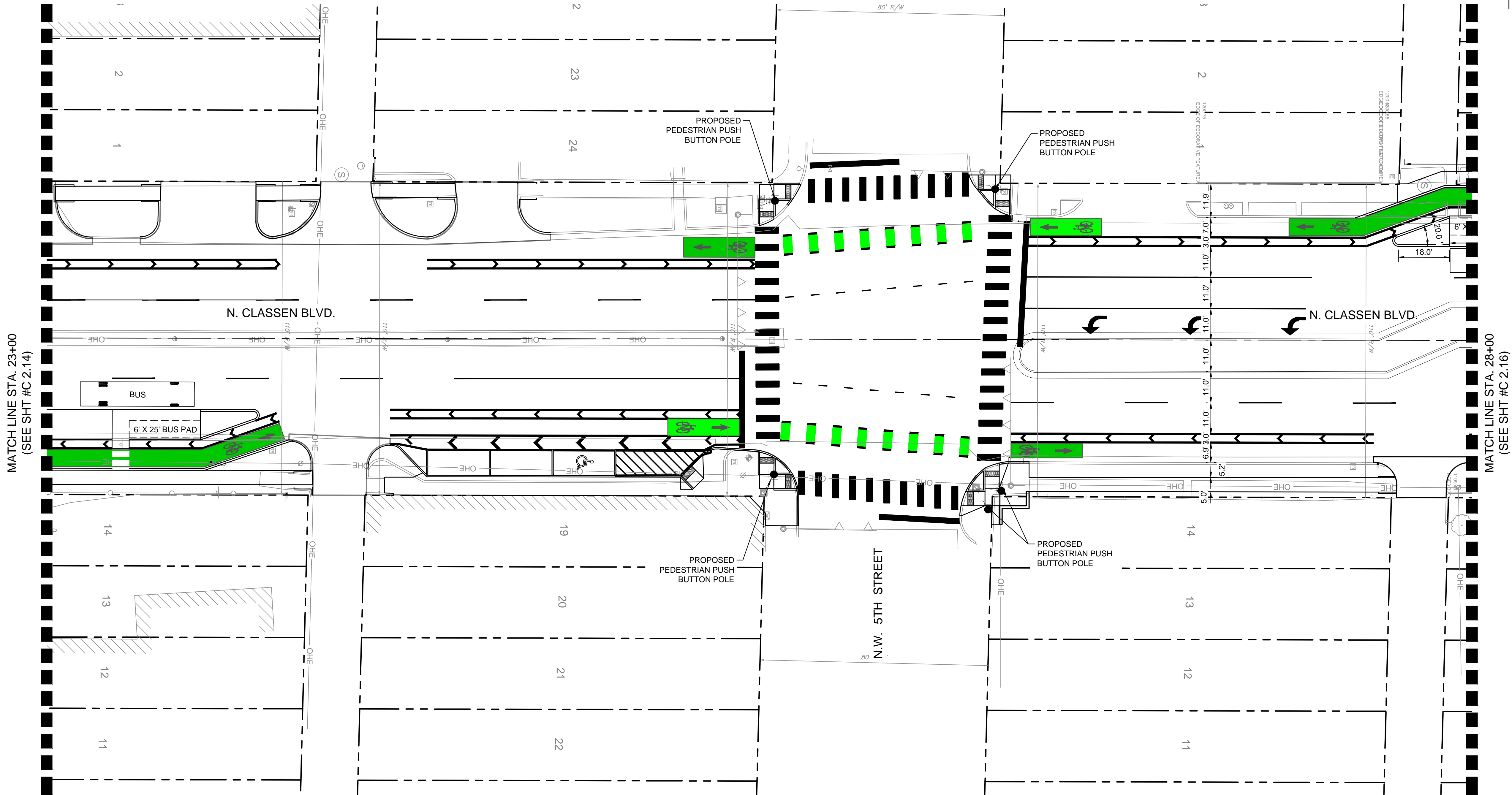
P.E. No. 18432 Date: 4/2022

Revised

By

Date

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Revision		Revision		Revision		Revision	
P.E. No. 19432		Date 4/2022		Date 4/2022		Date 4/2022	

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Engineer LYDIA M. LESLIE
P.E. No. 19432 Date 4/2022

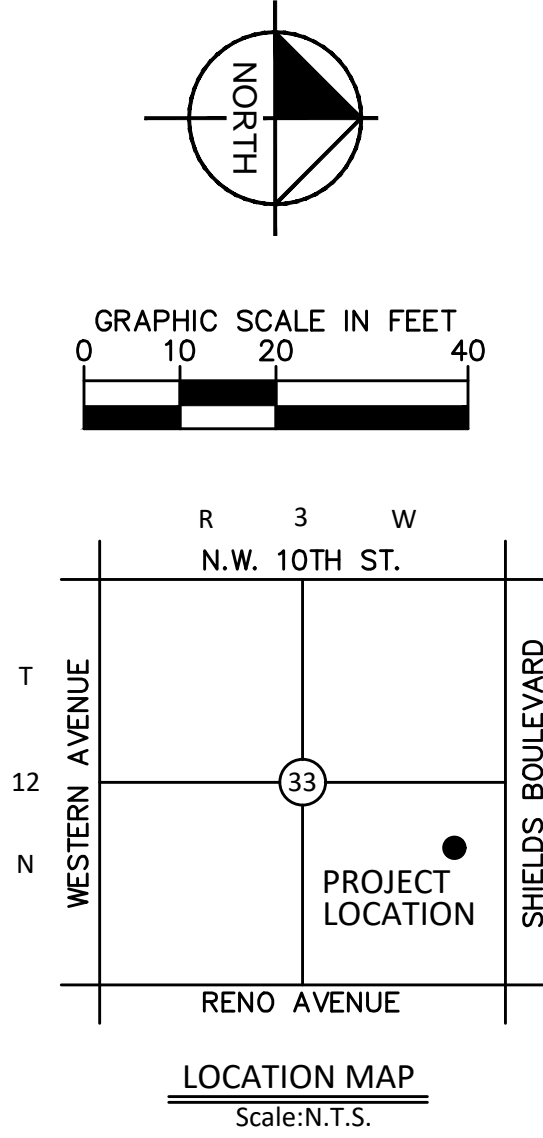
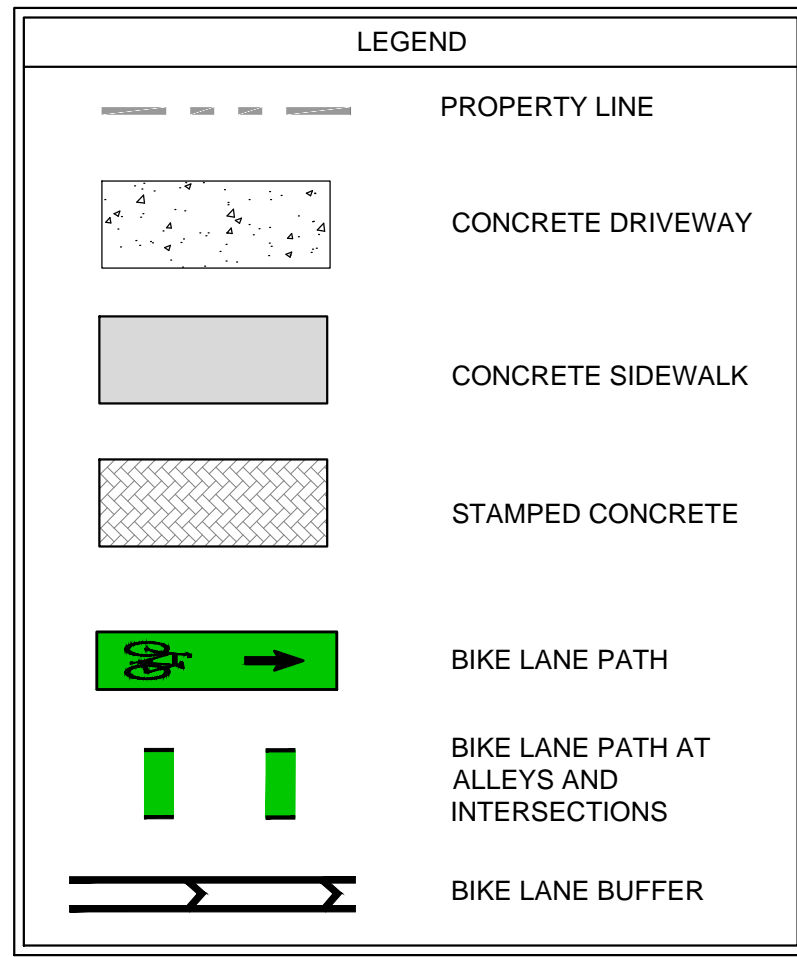
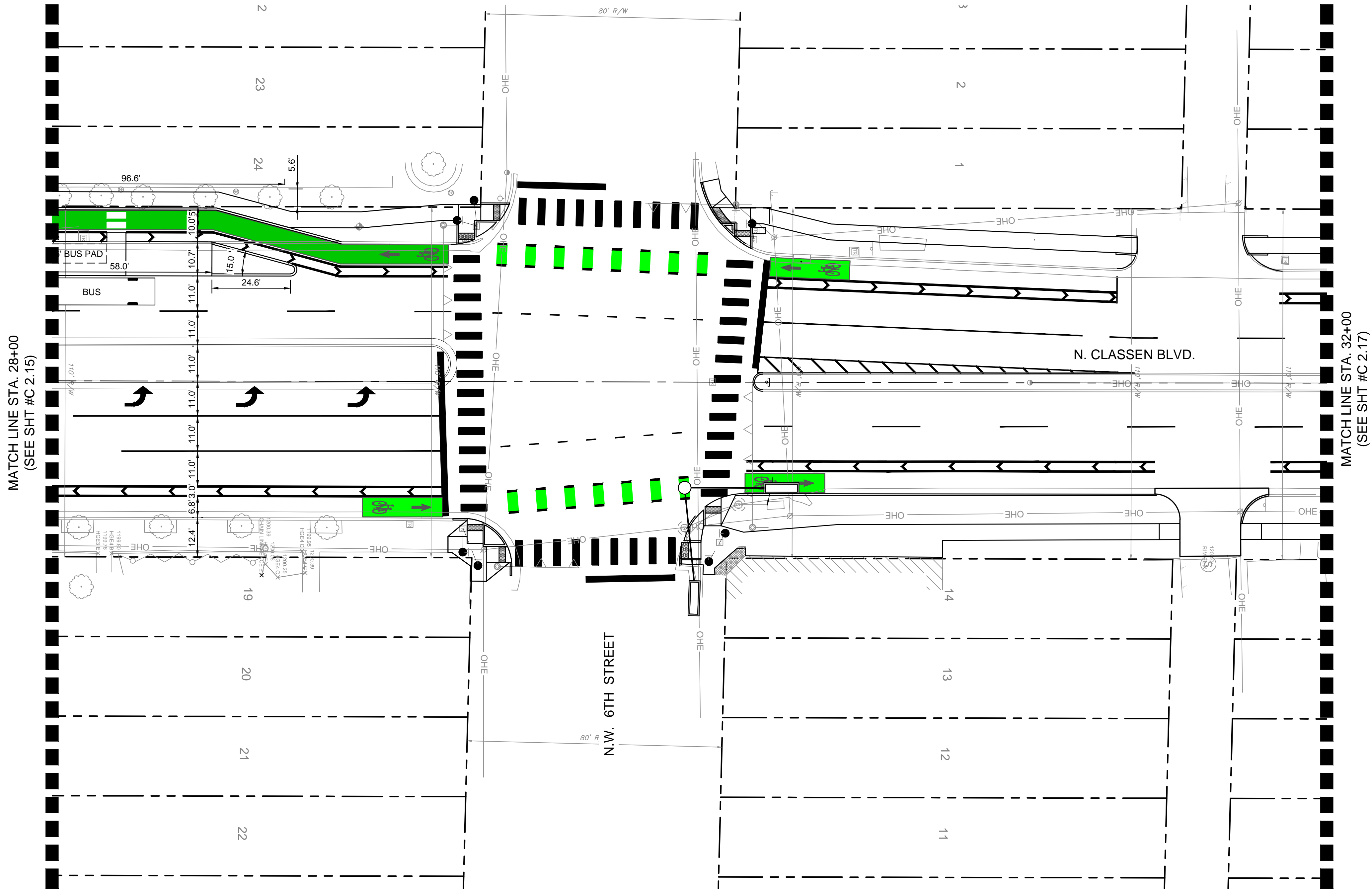
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CLASSEN
STREETSCAPE
OKLAHOMA CITY, OKLAHOMA

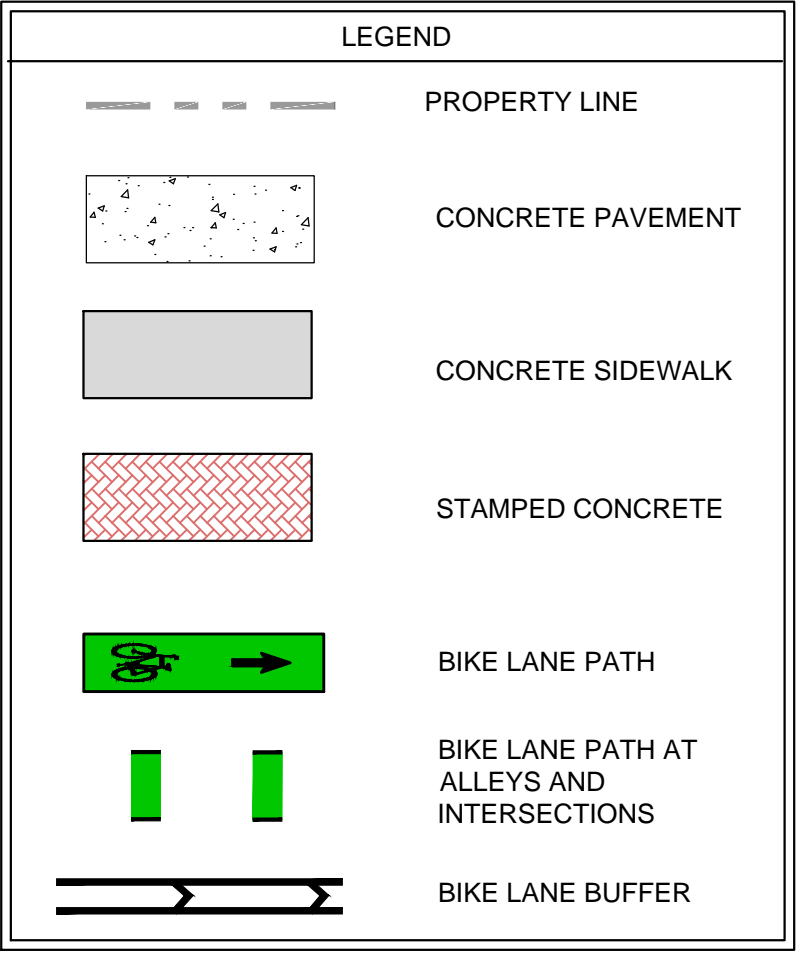
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MARKINGS (6 OF 10)

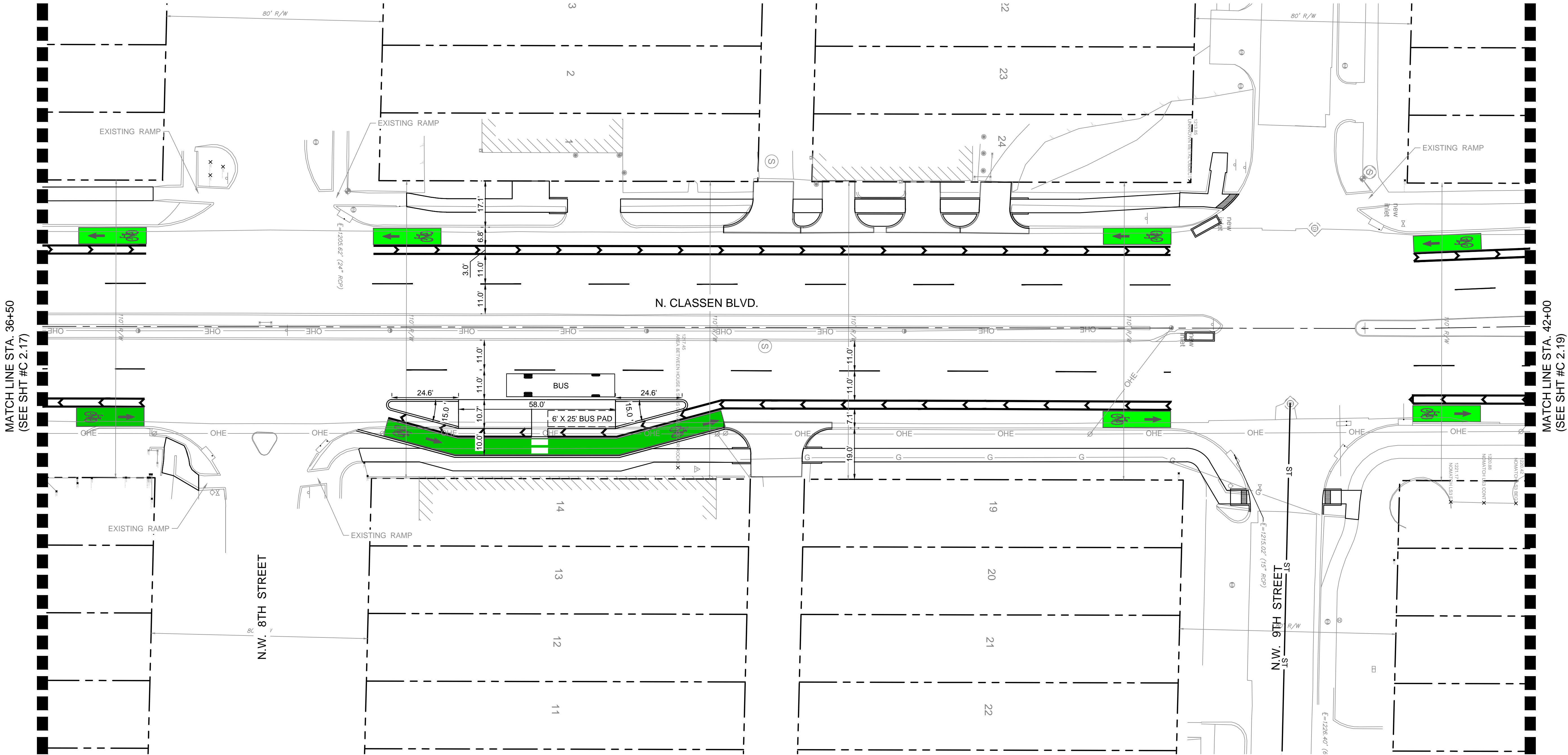
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KHA NO.:	LML	KB	

SHEET

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LEGEND

- PROPERTY LINE
- CONCRETE PAVEMENT
- CONCRETE SIDEWALK
- STAMPED CONCRETE
- DECORATIVE ROCK
- BIKE LANE PATH
- BIKE LANE PATH AT ALLEYS AND INTERSECTIONS
- BIKE LANE BUFFER

LOCATION MAP
Scale: N.T.S.

GRAPHIC SCALE IN FEET
0 10 20 40

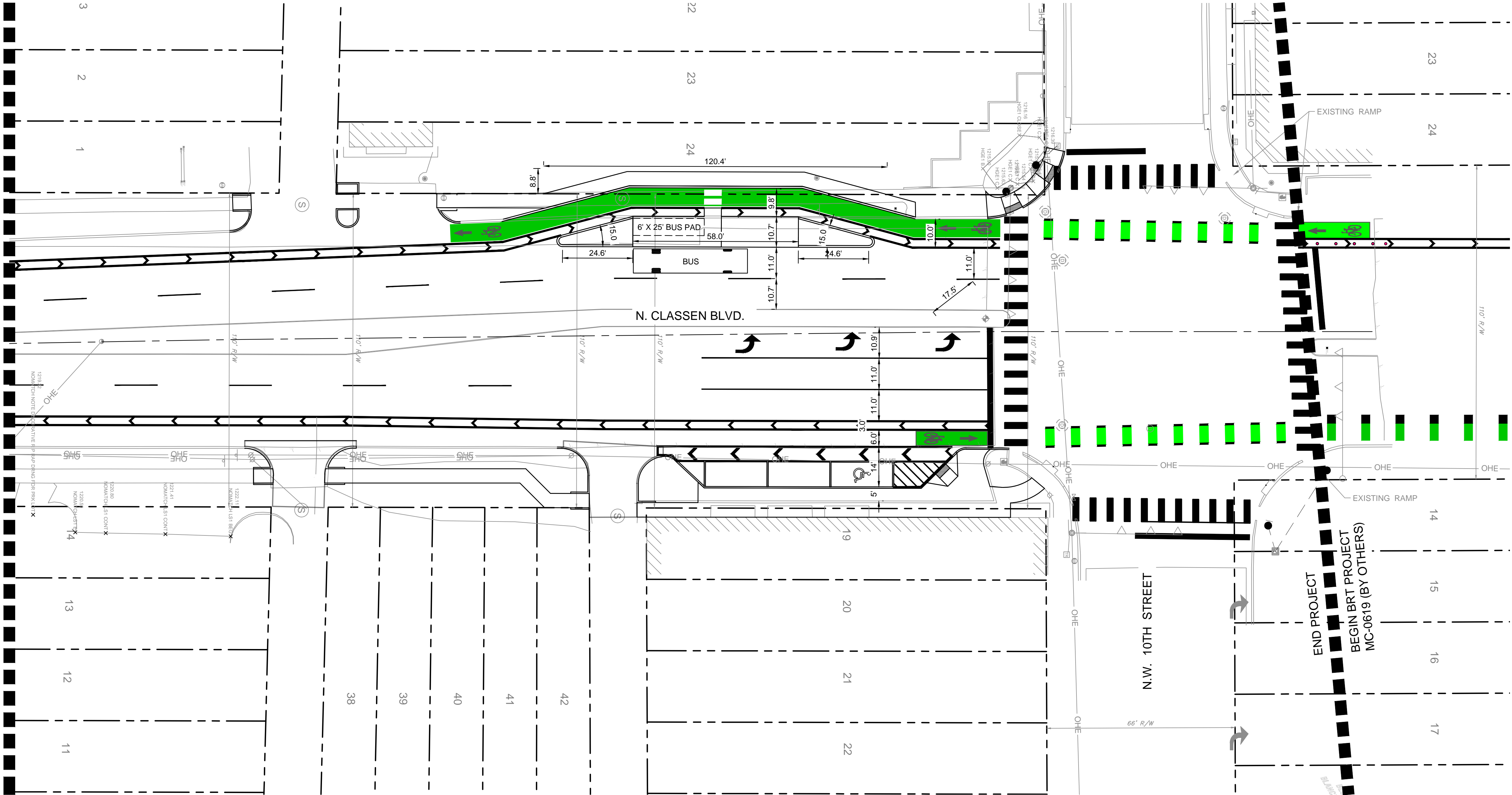
NORTH

WESTERN AVENUE
N.W. 10TH ST.
SHIELDS BOULEVARD
RENO AVENUE

PROJECT LOCATION

DATE: April 27, 2022		DESIGN: LML		SHEET	
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KHA NO.: 061292806		PC-0701 AND PC-0729		TRAFFIC & PAVEMENT MARKINGS (9 OF 10)	
CLASSEN STREETSCAPE		OKLAHOMA CITY, OKLAHOMA		Kimley»Horn	
FIRM No. 2740		P. 405-241-5493		14101 Wireless Way Bldg. A Ste. 150 Oklahoma City, OK 73134	
No.		Revision		By	
Date		Date		Date	

MATCHLINE STA. 42+00
(SEE SHT #C 2.18)



LEGEND

- PROPERTY LINE
- CONCRETE PAVEMENT
- CONCRETE SIDEWALK
- STAMPED CONCRETE
- BIKE LANE PATH
- BIKE LANE PATH AT ALLEYS AND INTERSECTIONS
- BIKE LANE BUFFER

GRAPHIC SCALE IN FEET
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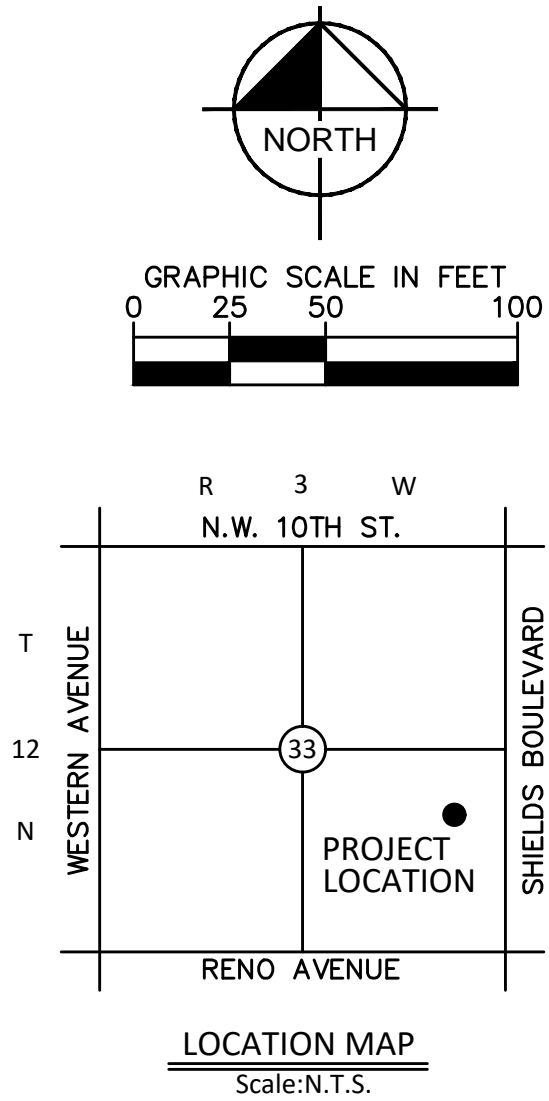
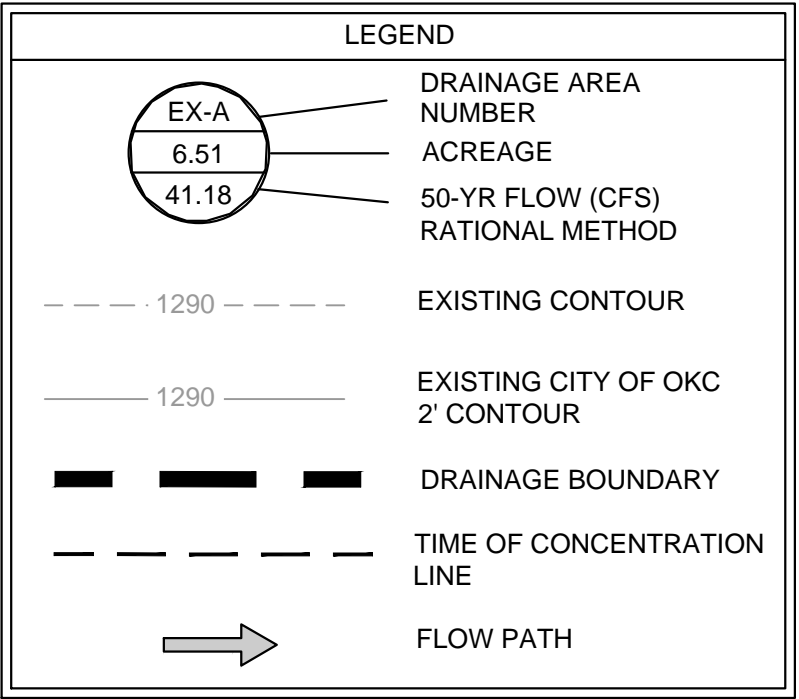
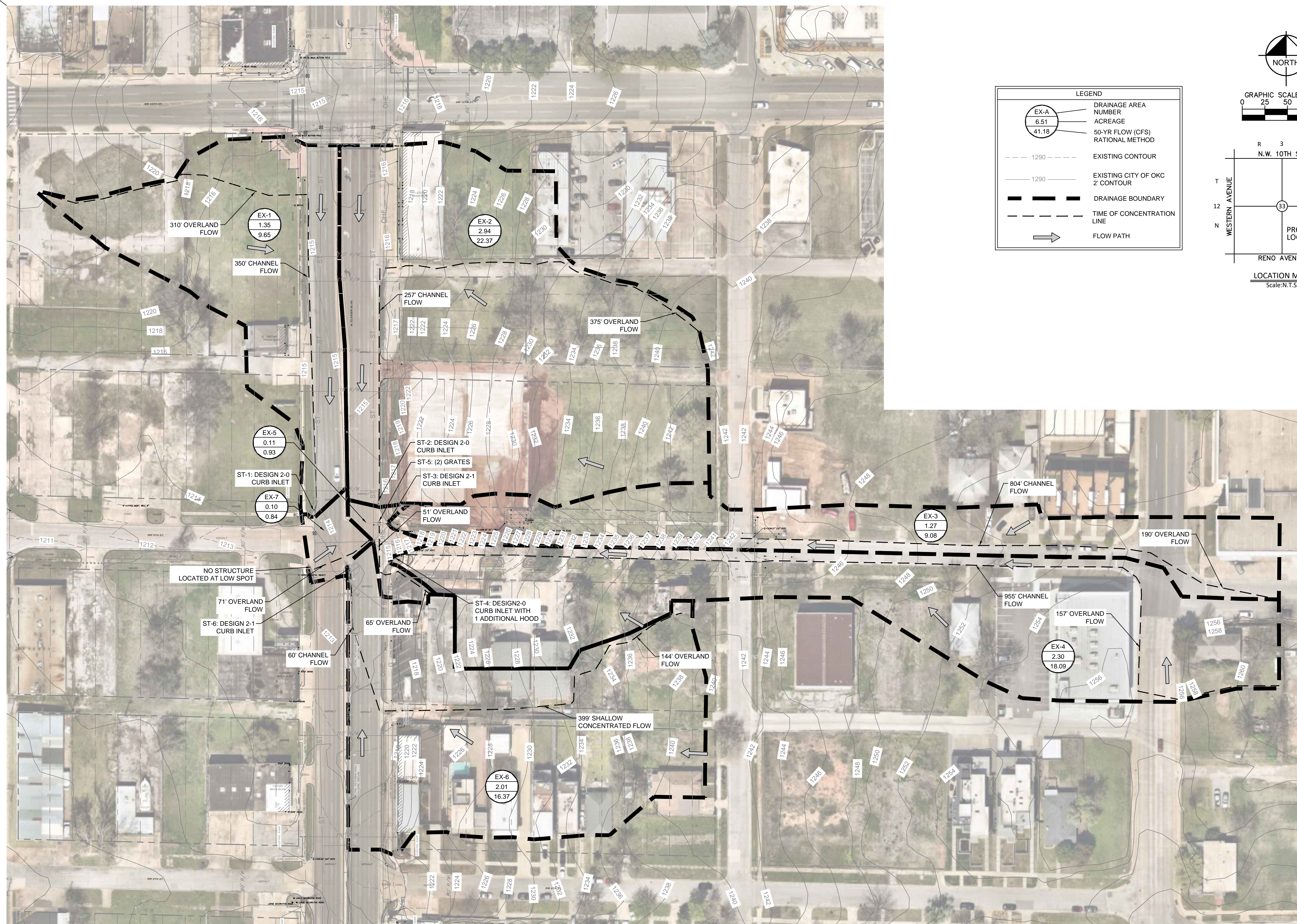
LOCATION MAP
Scale: N.T.S.

PROJECT LOCATION

WESTERN AVENUE
N.W. 10TH ST.
RENO AVENUE
SHIELDS BOULEVARD

NORTH

Kimley»Horn FIRM No. 2740 1401 Wireless Way Bldg. A Ste. 150 Oklahoma City, OK 73134 P: 405-241-5423		No.		By		Date	
Revision		Revision		Revision		Revision	
DATE: April 27, 2022		DESIGN: LML		DRAWN: KBY		CHECKED: KHA NO.:	
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Kimley»Horn		Engineer: LYDIA M. LESLIE		P.E. No. 18432		Date: 4/2022	

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PC-0701 AND PC-0729
CLASSEN
STREETSCAPE
OKLAHOMA CITY, OKLAHOMA

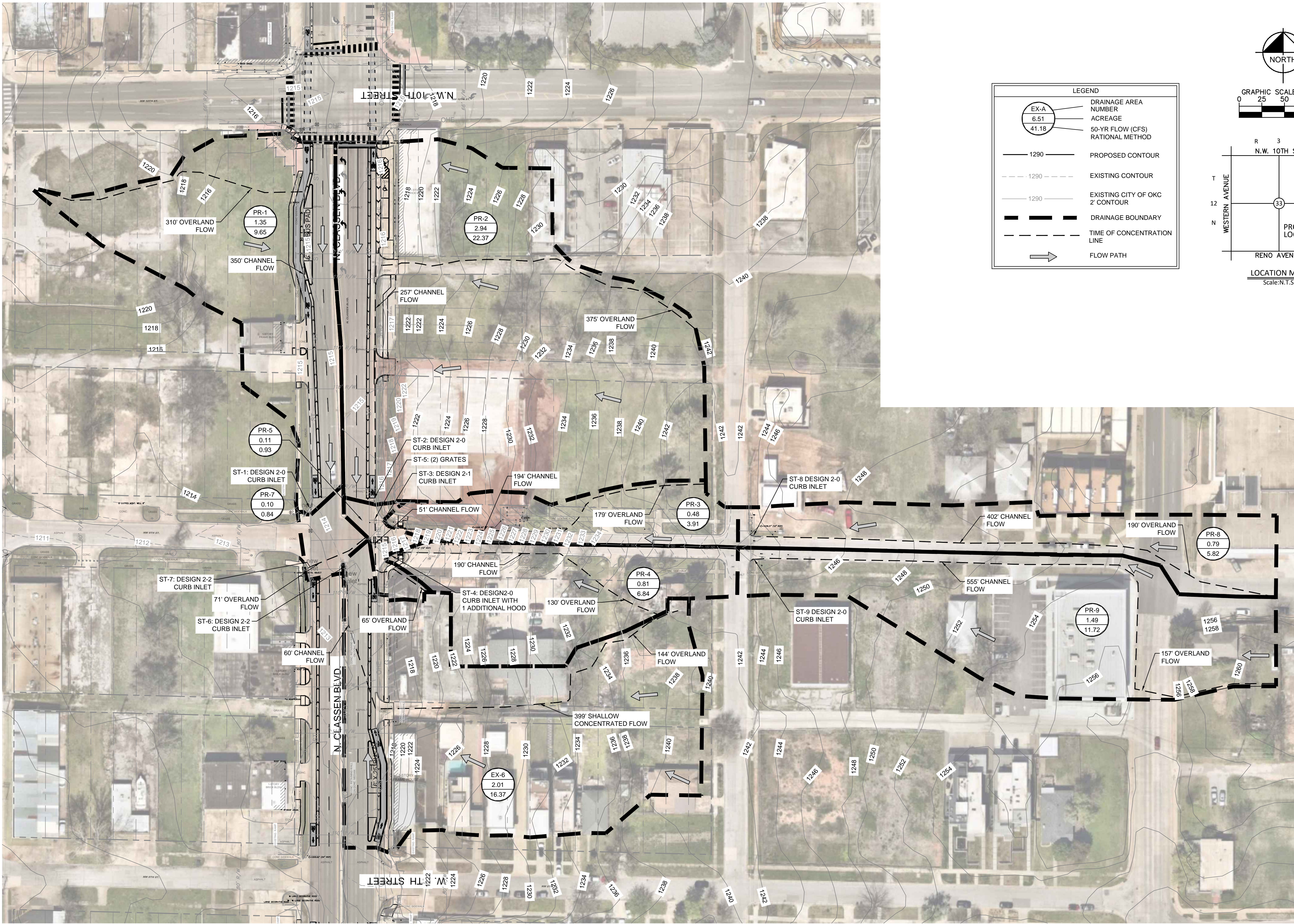
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LEGEND

- EX-A
6.51
41.18
DRAINAGE AREA NUMBER
ACREAGE
50-YR FLOW (CFS)
RATIONAL METHOD
- 1290
PROPOSED CONTOUR
- 1290
EXISTING CONTOUR
- 1290
EXISTING CITY OF OKC 2' CONTOUR
- DRAINAGE BOUNDARY
- - -
TIME OF CONCENTRATION LINE
- FLOW PATH

GRAPHIC SCALE IN FEET
0 25 50 100

LOCATION MAP
Scale: N.T.S.

NORTH

R 3 W
N.W. 10TH ST.

T 12 N
WESTERN AVENUE

PROJECT LOCATION

SHIELDS BOULEVARD

RENO AVENUE

Kimley»Horn
FIRM No. 2740
14101 Wireless Way, Bldg. A, Ste. 150, Oklahoma City, OK 73134
P: 405-241-5423
F: 405-241-5423
www.kimleyhorn.com

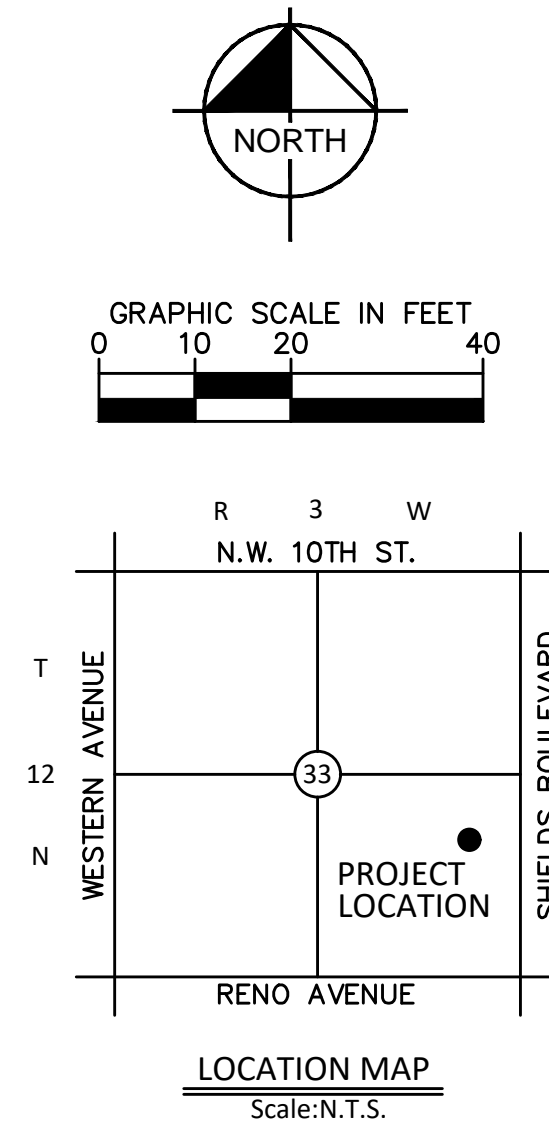
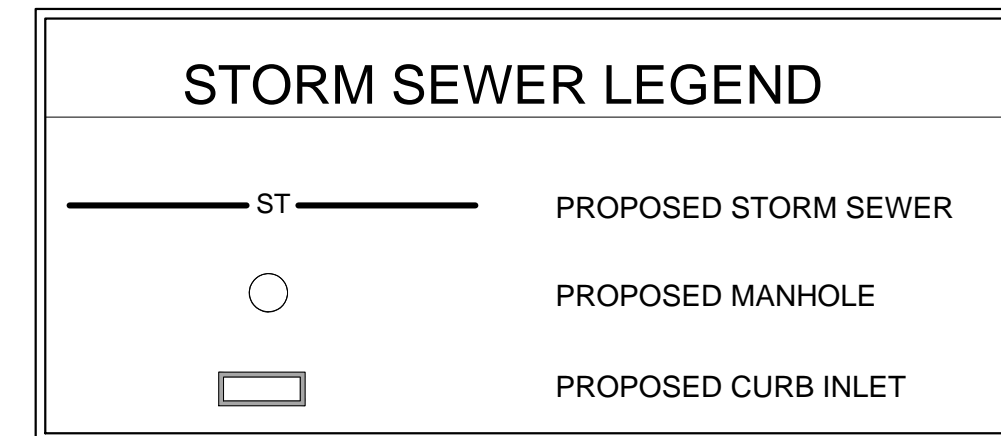
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Kimley»Horn
Engineer: LYDIA M. LESLIE
P.E. No. 19432 Date: 4/2022

PC-0701 AND PC-0729
CLASSEN
STREETSCAPE
OKLAHOMA CITY, OKLAHOMA

PROPOSED DRAINAGE
AREA MAP

DATE: December 28, 2020
DESIGN: LML
DRAWN: KBY
CHECKED: LML
KHA NO.: 061292806

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Appendix C: Drainage Report

CLASSEN STREETSCAPE

PC-0701

Preliminary Drainage Analysis Report



FEBRUARY 25, 2022

Prepared By:

Kimley»Horn

C.A. # 2740, Expires 6/30/21
14101 Wireless Way, Building A, Suite 150
Oklahoma City, OK 73134
405.241.5423



Contents

Project Overview	3
Existing Drainage Conditions	3
Proposed Drainage Conditions	4
Conclusion	5

PROJECT OVERVIEW

Kimley-Horn and Associates (KH) has performed a preliminary drainage analysis for the intersection at N Classen Boulevard and NW 9th Street in Oklahoma City, OK. This intersection has drainage issues that allows stormwater to pond especially in the southwest corner of the intersection. Therefore, the purpose of the drainage analysis was to determine the cause for ponding stormwater and provide solutions to improve drainage within the intersection.

EXISTING DRAINAGE CONDITIONS

The intersection of N Classen Boulevard and NW 9th Street has multiple curb inlets/grates and associated storm sewer that collects runoff from basins that extend from the intersection to NW 10th Street, N Shartel Avenue, and NW 8th Street. The southwest corner of the intersection is the low point of the intersection. All bypass from existing drainage structures flows to this corner and eventually drains south along the west side of Classen.

The main trunk line that collects all runoff from the intersection is a 5' 5" RCB. This 5' 5" RCB flows from north to south along the west side of Classen and not only collects stormwater from the Classen/9th Street intersection, but also collects runoff from drainage basins located north and south of the intersection. According to information received from the City of OKC, this RCB is in good condition.

A Design 2-0 curb inlet is located at the northwest corner of the intersection. This curb inlet was constructed on top of the 5' 5" RCB and collects runoff from the west side of Classen (and the associated property adjacent to Classen) between 9th Street and 10th Street. The curb inlet is in good condition.

A Design 2-1 curb inlet with concrete hoods is located along the south intersection median and collects runoff from the east side of Classen (and the associated property adjacent to Classen) between 9th Street and 8th Street. This curb inlet drains to the 5' 5" RCB and is in poor condition.

The southwest corner of the intersection does not have any drainage structures and primarily collects bypass runoff from the intersections drainage structures. This corner is relatively flat and ponds stormwater.

A Design 2-0 curb inlet, a Design 2-1 curb inlet, and two additional grates are located at the northeast corner of the intersection. These structures are in good condition and collect runoff from the east side of Classen (and the associated property adjacent to Classen) between 9th Street and 10th Street and also collect runoff from the north side of 9th Street (and the associated property adjacent to 9th Street) between Classen and Shartel. These structures drain to a 3' 4" brick box located along the east side of Classen. This brick box flows from north to south and drains into a manhole near the centerline of 9th Street which serves as a collection point for multiple storm sewer pipes. Not only does this brick box collect runoff from the Classen/9th Street intersection, but it also collects runoff from drainage basins located to the north of the intersection. According to information received from the City of OKC, this brick box is in decent condition with some debris (15%) located within the line approximately 76 feet north of the manhole.

A Design 2-0 curb inlet with one additional hood is located at the southeast corner of the intersection. This curb inlet drains to the manhole located near the centerline of 9th Street and collects runoff from the south side of 9th Street (and the associated property adjacent to 9th Street) between Classen and Shartel.

There is also a 15 clay/brick storm sewer that flows from east to west along 9th Street between Classen and N Francis Avenue that drains into the manhole located near the centerline of 9th Street. This storm sewer collects runoff from two curb inlets located at the northeast and southeast corners of the 9th Street/Francis intersection; however, the southwest curb inlet has been covered by asphalt. Additionally, according to information received from the City of OKC, this line is collapsed and little to no runoff can pass through the line. Therefore, it was determined that all runoff associated with this storm sewer will drain directly to the Classen/9th Street intersection.

All the runoff that collects in the manhole located near the centerline of 9th Street exits the manhole through a 3' 4" brick box that drains into the 5' 5" RCB. According to information received from the City of OKC, this brick box is in decent condition and is clear of debris.

Reference the Appendix for the extent of the existing drainage basins and the time-of-concentration paths. Also, reference the Appendix for existing peak flows and time-of-concentration calculations.

PROPOSED DRAINAGE CONDITIONS

Given the existing site conditions and the information provided by the City of OKC, damaged lines/drainage structures were identified that need replacement. Additionally, the survey identified that the low point of the intersection does not have a drainage structure. These items hinder the drainage of stormwater at the Classen/9th Street intersection and need to be corrected.

The 15 clay/brick storm sewer between Classen and N Francis Avenue and the two associated curb inlets will be removed and replaced with 18" RCP and Design 2-0 curb inlets. These curb inlets will now capture runoff from the drainage basins that extend from Francis to Shartel. This will reduce stormwater that is flowing down 9th Street directly into the Classen/9th Street intersection.

The Design 2-1 curb inlet with concrete hoods that is located along the south intersection median and is in poor condition will be replaced with a Design 2-2 curb inlet. Increasing the size of this inlet allows some bypass runoff (from structures along the east side of the intersection) to be captured before draining to the southwest intersection corner. As the drainage system is further analyzed, the 18" RCP associated with this curb inlet may also be replaced and upsized.

A Design 2-2 curb inlet with associated junction box will be installed at the southwest corner of the intersection. This corner is the low point of the intersection and receives all bypass flows from all other intersection structures. Additionally, this corner is relatively flat which helps to facilitate ponding in the area.

By replacing damaged lines/structures and installing a curb inlet at the low point of the intersection, the drainage will be greatly improved at N Classen Boulevard and NW 9th Street.

Reference the Appendix for the extent of the proposed drainage basins and the time-of-concentration paths. Also, reference Appendix D for proposed peak flows, time-of-concentration values and runoff coefficients (C-values). Per the Oklahoma City Drainage Manual (Chapter 5, Section 5.3.1.E.), the proposed storm sewer inlets at sump locations that carry the 100-year storm will not require an overflow structure. The capacity of the inlets are shown in the table below.

Inlet #	Inlet Design	Q _{Cap} (cfs)	Q ₁₀₀ (cfs)	Q _{bypass} (cfs)	Overflow to DS Inlet	Flows to
STR-1	2-0	8.2	10.53		2.33 cfs to ST-7	5'x5' Box
STR-2	2-0	8.2	24.37		16.17 cfs to ST-5	18" RCP
STR-3	2-1	13.2	4.25	8.46 (from ST-5)	None	15" RCP
STR-4	2-1	13.2	12.00	4.56 (from ST-9)	None	15" RCP
STR-5	2 grates	8.72	1.01	16.17 (from ST-2)	8.46 cfs to ST-3	15" RCP
STR-6	2-2	18.20	17.81		None	18" RCP
STR-7	2-2	18.20	0.92	2.33 (from ST-1)	None	5' x 5' Box
STR-8	2-0	8.2	6.35		None	18" RCP
STR-9	2-0	8.2	12.76		4.56 cfs to ST-4	18" RCP

Inlet Capacity Estimates

Pipe structures will be placed on 9th Street between Classen Boulevard and N Francis Avenue. The proposed capacity estimates are shown in the table below:

Pipe From	Pipe To	Area to Pipe (AC)	Tc	Intensity	C	Q50 (cfs)	Pipe	Pipe Slope (Minimum)	Pipe Capacity (cfs)
ST-8	Manhole	0.79	9.0	8.19	0.9	5.82	18" RCP	1.0%	10.51
ST-9	Manhole	1.49	7.1	8.74	0.9	11.72	18" RCP	1.3%	11.98
ST8+9	Manhole	2.28	9.0	8.19	0.9	16.81	18" RCP	2.6%	16.94

Proposed Pipe Capacity on 9th Street between Classen Boulevard and N. Francis

CONCLUSION

The proposed project drainages scope included reduction of ponding and flooding at the intersection of NW 9th and Classen Boulevard. Replacing damaged storm sewer along 9th Street between Classen Boulevard and N. Francis Avenue, replacing damaged inlets, and adding one new inlet in a low area along NW 9th and Classen will help aid in the reduction of ponding and flooding. The existing trunk line along Classen Boulevard is not within the scope of this project to analyze capacity. The trunk lines were noted by the City as functioning drainage pipes. Further capacity and sizing calculations of the proposed drainage structures along NW 9th Street will be made in the 60% drainage report.

APPENDIX

Appendix A Drainage Area Maps

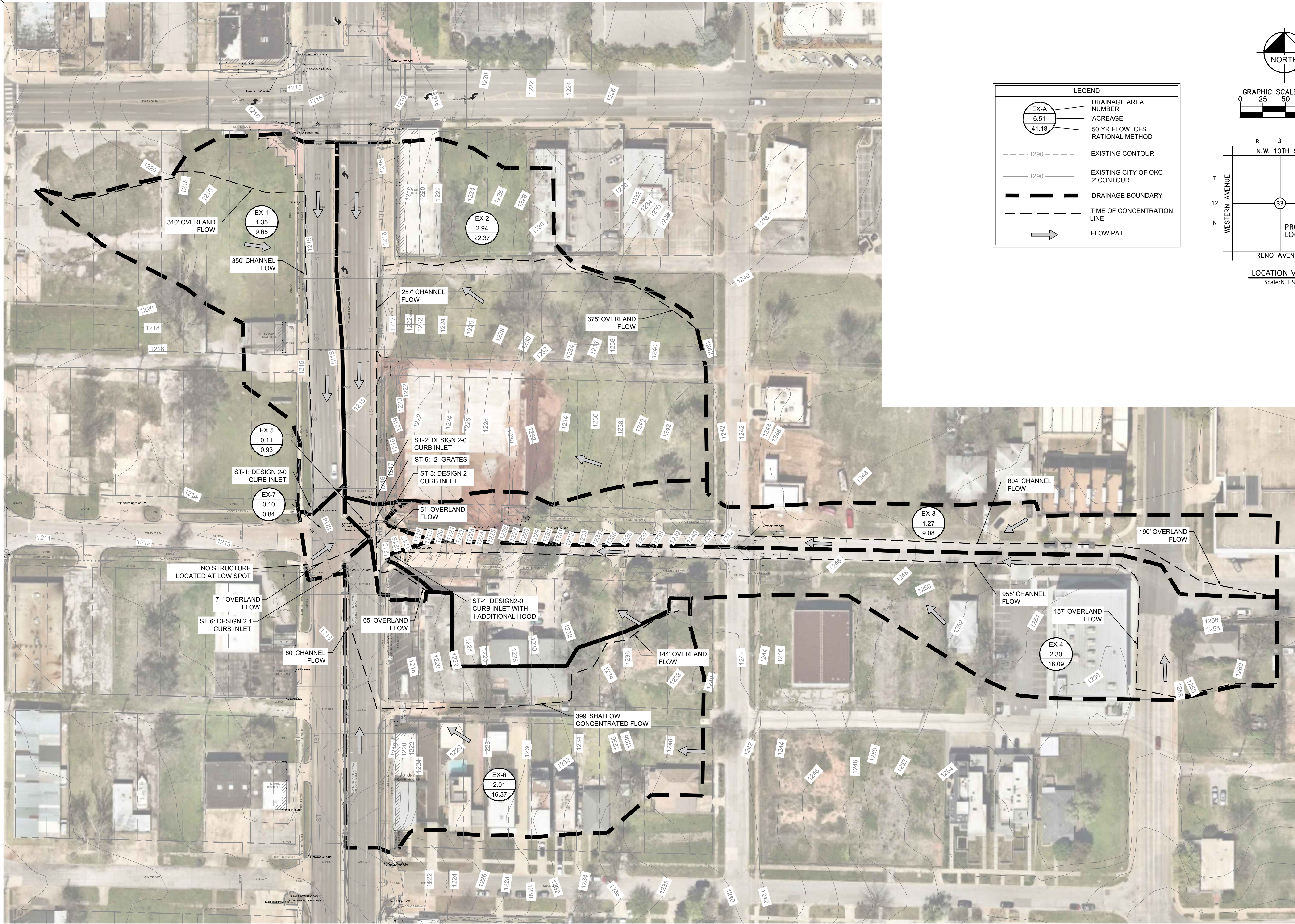
Appendix B Proposed Plans

Appendix C Time of Concentration Worksheet

Appendix D Hydraflow Hydrographs Report

APPENDIX A

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1401 Wireless Way, Bldg. A, Ste. 150, Oklahoma City, OK 73134
P.E. No. 19432
Date: 8/2020
By: [Signature]
Revision: [Signature]

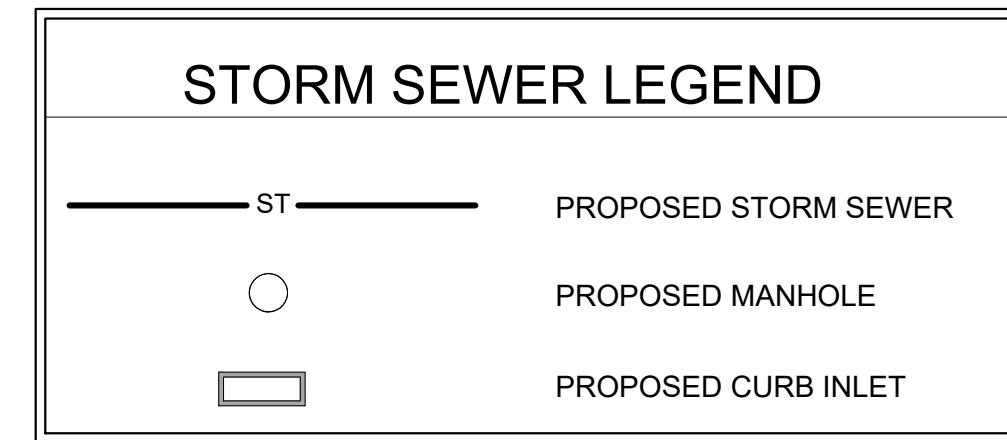
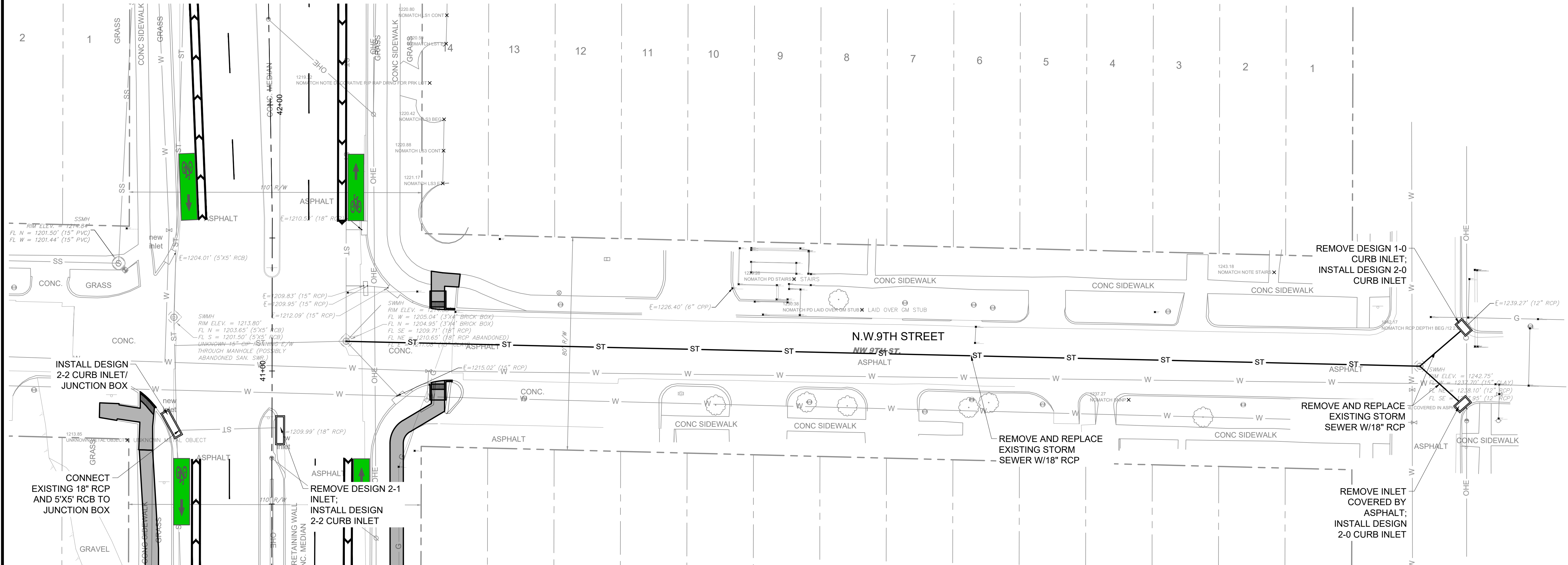
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Kimley»Horn
Engineer: LYDIA M. LESLIE
P.E. No. 19432 Date: 8/2020

PC-0701
CLASSEN
STREETSCAPE
OKLAHOMA CITY, OKLAHOMA

EXISTING DRAINAGE
AREA MAP

DATE: September 16, 2020	LML	KBV	LML	061292806
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APPENDIX B



PC-0701
CLASSEN
STREETSCAPE
OKLAHOMA CITY, OKLAHOMA

No.		Revision	By	Date

DATE:	September 17, 2020
DESIGN:	LML
DRAWN:	KBY
CHECKED:	LML
KHA NO.:	061292806

APPENDIX C

Time of Concentration Calcs: Existing Conditions

Drainage Areas		Overland Flow										Channel Flow									
		Max Elev.	Min. Elev.	Flow Length L	Slope S	Coverage Type	K	To	Max Elev.	Min. Elev.	Flow Length L	Slope S	Cross Sectional Area	Wetted Perimeter	Material	Manning's N	Velocity	Tf	Total Tc	Design Tc	
								min.	ft	ft	ft	ft/ft	sqft	ft			ft/s	min.	min.	min.	
EX-1	ST-1																				
1.35 AC		1224.00	1215.50	310	0.027	Industrial/Commercial	0.445	7.6	1215.00	1213.75	350	0.004	3.13	12.75	Concrete	0.013	2.7	2.2	9.8	9.8	
																Total Design Tc for EX-1			10		
EX-2	ST-2																				
2.94 AC		1242.00	1215.75	375	0.070	Industrial/Commercial	0.445	6.8	1215.75	1214.25	257	0.006	3.13	12.75	Concrete	0.013	3.4	1.2	8.0	8.0	
																Total Design Tc for EX-2			8		
EX-3	ST-3																				
1.27 AC		1255.50	1254.00	190	0.008	Industrial/Commercial	0.445	8.2	1254.00	1215.00	804	0.049	3.13	12.75	Concrete	0.013	9.9	1.4	9.5	9.5	
																Total Design Tc for EX-3			10		
EX-4	ST-4																				
2.30 AC		1261.00	1256.00	157	0.032	Industrial/Commercial	0.445	5.8	1256.00	1215.00	955	0.043	3.13	12.75	Concrete	0.013	9.3	1.7	7.5	7.5	
																Total Design Tc for EX-4			7		
EX-5	ST-5																				
0.11 AC		1221.00	1215.00	65	0.092	Industrial/Commercial	0.445	3.4	1214.50	1214.15	51	0.007	3.13	12.75	Concrete	0.013	3.7	0.2	3.6	3.6	
																Total Design Tc for EX-5			5		
EX-6	ST-6																				
2.01 AC		1242.00	1234.00	144	0.056	Industrial/Commercial	0.445	5.0	1223.00	1213.75	235	0.039	3.13	12.75	Concrete	0.013	8.9	0.4	5.4	5.4	
									1234.00	1223.00	164	0.067	3.13	12.75	Grass Channel	0.026	5.8	0.5	0.5	0.5	
																Total Design Tc for EX-6			6		
EX-7	NA																				
0.10 AC		1214.40	1213.40	71	0.014	Industrial/Commercial	0.445	5.1											5.1	5.1	
																Total Design Tc for EX-7			5		

Time of Concentration Calcs: Proposed Conditions

Drainage Areas		Overland Flow										Channel Flow									
		Max Elev.	Min. Elev.	Flow Length L	Slope S	Coverage Type	K	To	Max Elev.	Min. Elev.	Flow Length L	Slope S	Cross Sectional Area	Wetted Perimeter	Material	Manning's N	Velocity	Tf	Total Tc	Design Tc	
								min.	ft	ft							ft	ft/ft			sqft
DA No.	Struc. No.	ft	ft	ft	ft/ft																
PR-1	ST-1																				
1.35 AC		1224.00	1215.50	310	0.027	Industrial/Commercial	0.445	7.6	1215.00	1213.75	350	0.004	3.13	12.75	Concrete	0.013	2.7	2.2	9.8	9.8	
																Total Design Tc for		PR-1	10		
PR-2	ST-2																				
2.94 AC		1242.00	1215.75	375	0.070	Industrial/Commercial	0.445	6.8	1215.75	1214.25	257	0.006	3.13	12.75	Concrete	0.013	3.4	1.2	8.0	8.0	
																Total Design Tc for		PR-2	8		
PR-3	ST-3																				
0.48 AC		1243.00	1231.50	179	0.064	Industrial/Commercial	0.445	5.3	1231.00	1215.00	194	0.082	3.13	12.75	Concrete	0.013	12.9	0.3	5.5	5.5	
																Total Design Tc for		PR-3	6		
PR-4	ST-4																				
0.81 AC		1241.00	1231.00	130	0.077	Industrial/Commercial	0.445	4.5	1231.00	1215.00	190	0.084	3.13	12.75	Concrete	0.013	13.0	0.2	4.7	4.7	
																Total Design Tc for		PR-4	5		
PR-5	ST-5																				
0.11 AC		1221.00	1215.00	65	0.092	Industrial/Commercial	0.445	3.4	1214.50	1214.15	51	0.007	3.13	12.75	Concrete	0.013	3.7	0.2	3.6	3.6	
																Total Design Tc for		PR-5	5		
PR-6	ST-6																				
2.01 AC		1242.00	1234.00	144	0.056	Industrial/Commercial	0.445	5.0	1223.00	1213.75	235	0.039	3.13	12.75	Concrete	0.013	8.9	0.4	5.4	5.4	
									1234.00	1223.00	164	0.067	3.13	12.75	Grass Channel	0.026	5.8	0.5	0.5	0.5	
																Total Design Tc for		PR-6	6		
PR-7	ST-7																				
0.10 AC		1214.40	1213.40	71	0.014	Industrial/Commercial	0.445	5.1											5.1	5.1	
																Total Design Tc for		PR-7	5		
PR-8	ST-8																				
0.79 AC		1255.50	1254.00	190	0.008	Industrial/Commercial	0.445	8.2	1254.00	1242.25	402	0.029	3.13	12.75	Concrete	0.013	7.7	0.9	9.0	9.0	
																Total Design Tc for		PR-8	9		
PR-9	ST-9																				
1.49 AC		1261.00	1256.00	157	0.032	Industrial/Commercial	0.445	5.8	1256.00	1242.50	555	0.024	3.13	12.75	Concrete	0.013	7.0	1.3	7.1	7.1	
																Total Design Tc for		PR-9	7		

APPENDIX D

Hydrograph Summary Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2022

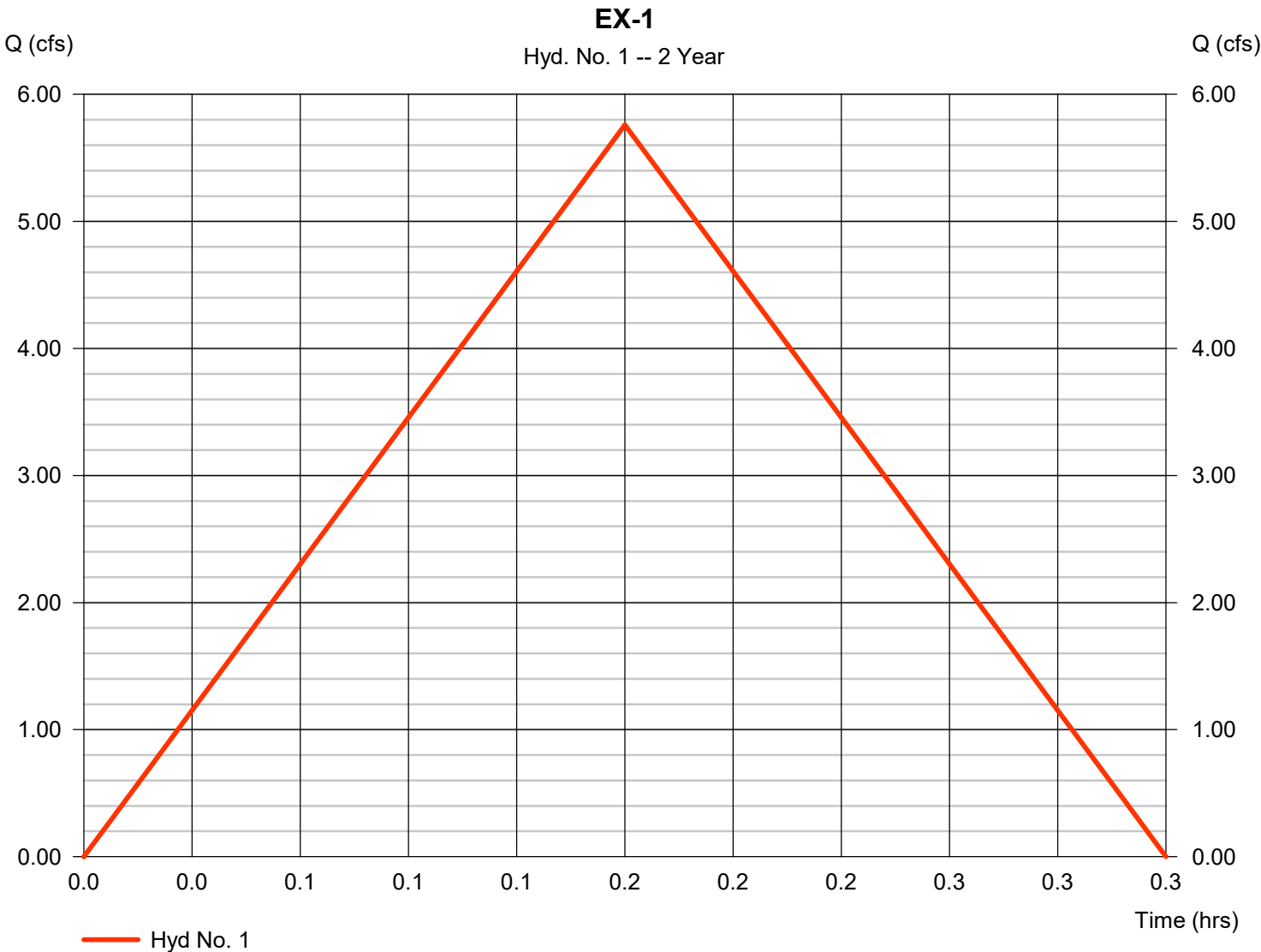
Hyd. No.	Hydrograph type (origin)	Peak flow (cfs)	Time interval (min)	Time to Peak (min)	Hyd. volume (cuft)	Inflow hyd(s)	Maximum elevation (ft)	Total strge used (cuft)	Hydrograph Description
1	Rational	5.760	1	10	3,456	-----	-----	-----	EX-1
2	Rational	13.47	1	8	6,465	-----	-----	-----	EX-2
3	Rational	5.419	1	10	3,251	-----	-----	-----	EX-3
4	Rational	10.94	1	7	4,595	-----	-----	-----	EX-4
5	Rational	0.567	1	5	170	-----	-----	-----	EX-5
6	Rational	9.945	1	6	3,580	-----	-----	-----	EX-6
7	Rational	0.515	1	5	155	-----	-----	-----	EX-7
8	Rational	5.760	1	10	3,456	-----	-----	-----	PR-1
9	Rational	13.47	1	8	6,465	-----	-----	-----	PR-2
10	Rational	2.375	1	6	855	-----	-----	-----	PR-3
11	Rational	4.176	1	5	1,253	-----	-----	-----	PR-4
12	Rational	0.567	1	5	170	-----	-----	-----	PR-5
13	Rational	9.945	1	6	3,580	-----	-----	-----	PR-6
14	Rational	0.515	1	5	155	-----	-----	-----	PR-7
15	Rational	3.490	1	9	1,885	-----	-----	-----	PR-8
16	Rational	7.088	1	7	2,977	-----	-----	-----	PR-9
Flows.gpw					Return Period: 2 Year			Friday, 02 / 11 / 2022	

Hydrograph Report

Hyd. No. 1

EX-1

Hydrograph type	= Rational	Peak discharge	= 5.760 cfs
Storm frequency	= 2 yrs	Time to peak	= 0.17 hrs
Time interval	= 1 min	Hyd. volume	= 3,456 cuft
Drainage area	= 1.350 ac	Runoff coeff.	= 0.9
Intensity	= 4.741 in/hr	Tc by User	= 10.00 min
IDF Curve	= OKC, OK IDF.IDF	Asc/Rec limb fact	= 1/1

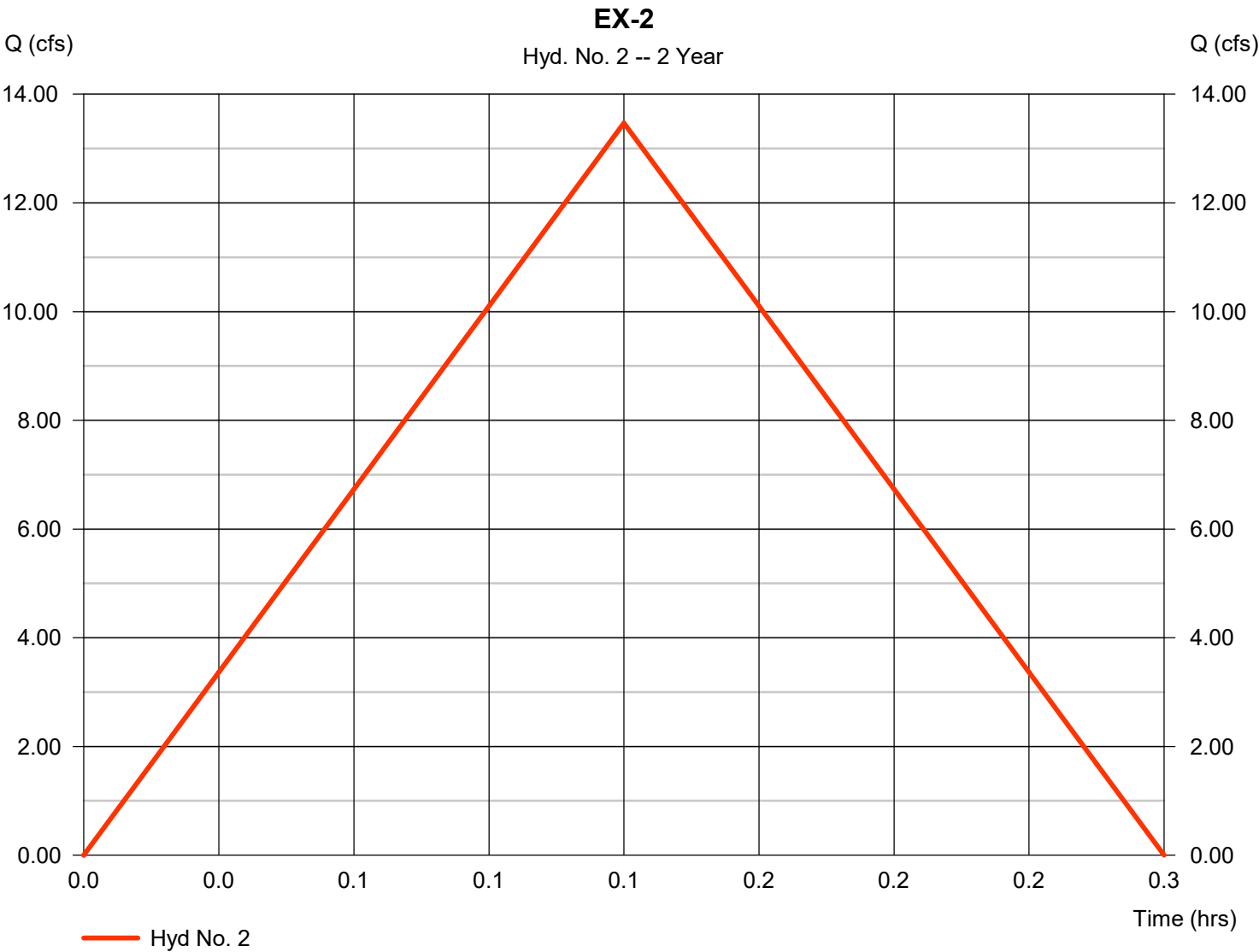


Hydrograph Report

Hyd. No. 2

EX-2

Hydrograph type	= Rational	Peak discharge	= 13.47 cfs
Storm frequency	= 2 yrs	Time to peak	= 0.13 hrs
Time interval	= 1 min	Hyd. volume	= 6,465 cuft
Drainage area	= 2.940 ac	Runoff coeff.	= 0.9
Intensity	= 5.090 in/hr	Tc by User	= 8.00 min
IDF Curve	= OKC, OK IDF.IDF	Asc/Rec limb fact	= 1/1

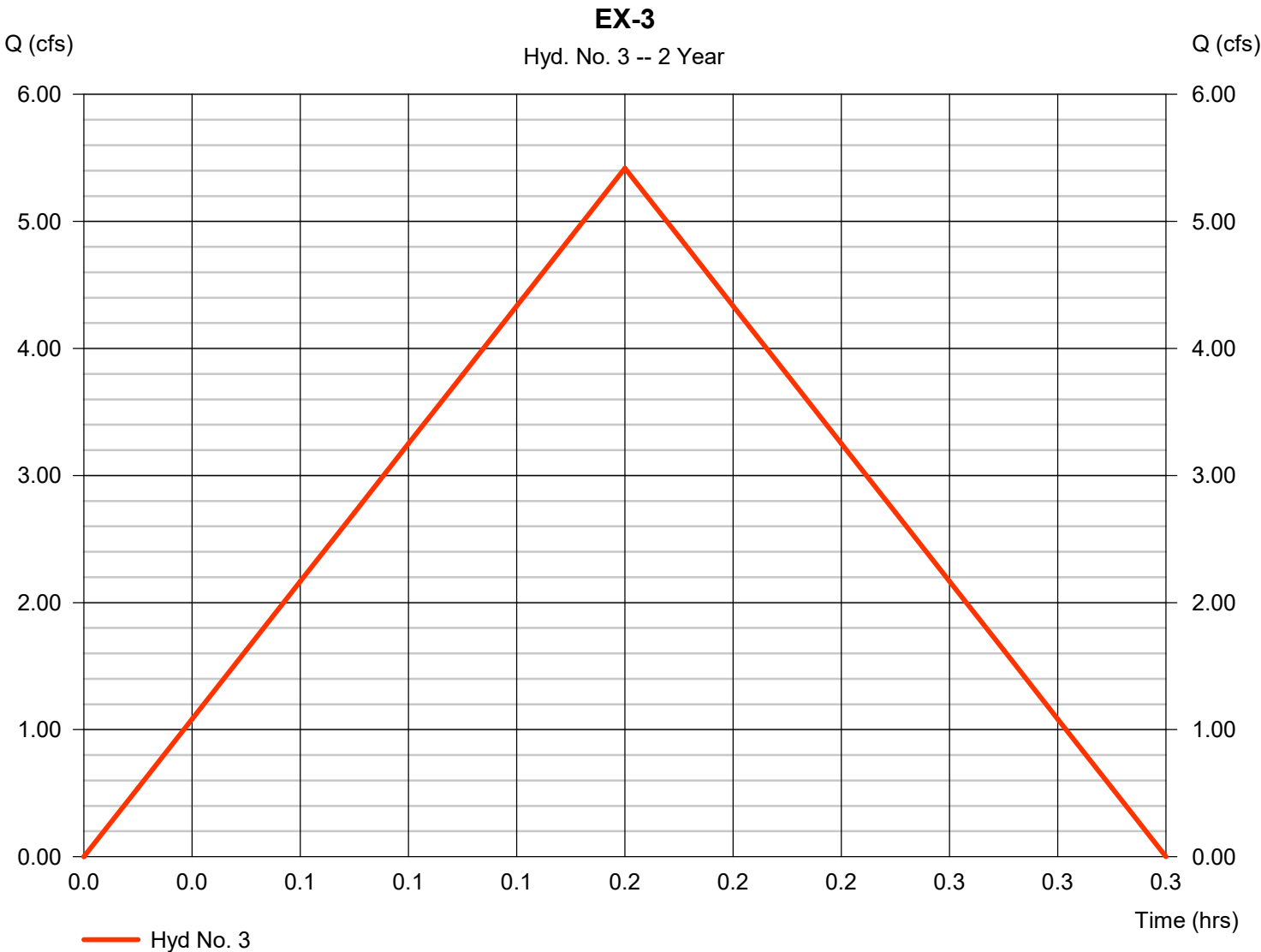


Hydrograph Report

Hyd. No. 3

EX-3

Hydrograph type	= Rational	Peak discharge	= 5.419 cfs
Storm frequency	= 2 yrs	Time to peak	= 0.17 hrs
Time interval	= 1 min	Hyd. volume	= 3,251 cuft
Drainage area	= 1.270 ac	Runoff coeff.	= 0.9
Intensity	= 4.741 in/hr	Tc by User	= 10.00 min
IDF Curve	= OKC, OK IDF.IDF	Asc/Rec limb fact	= 1/1

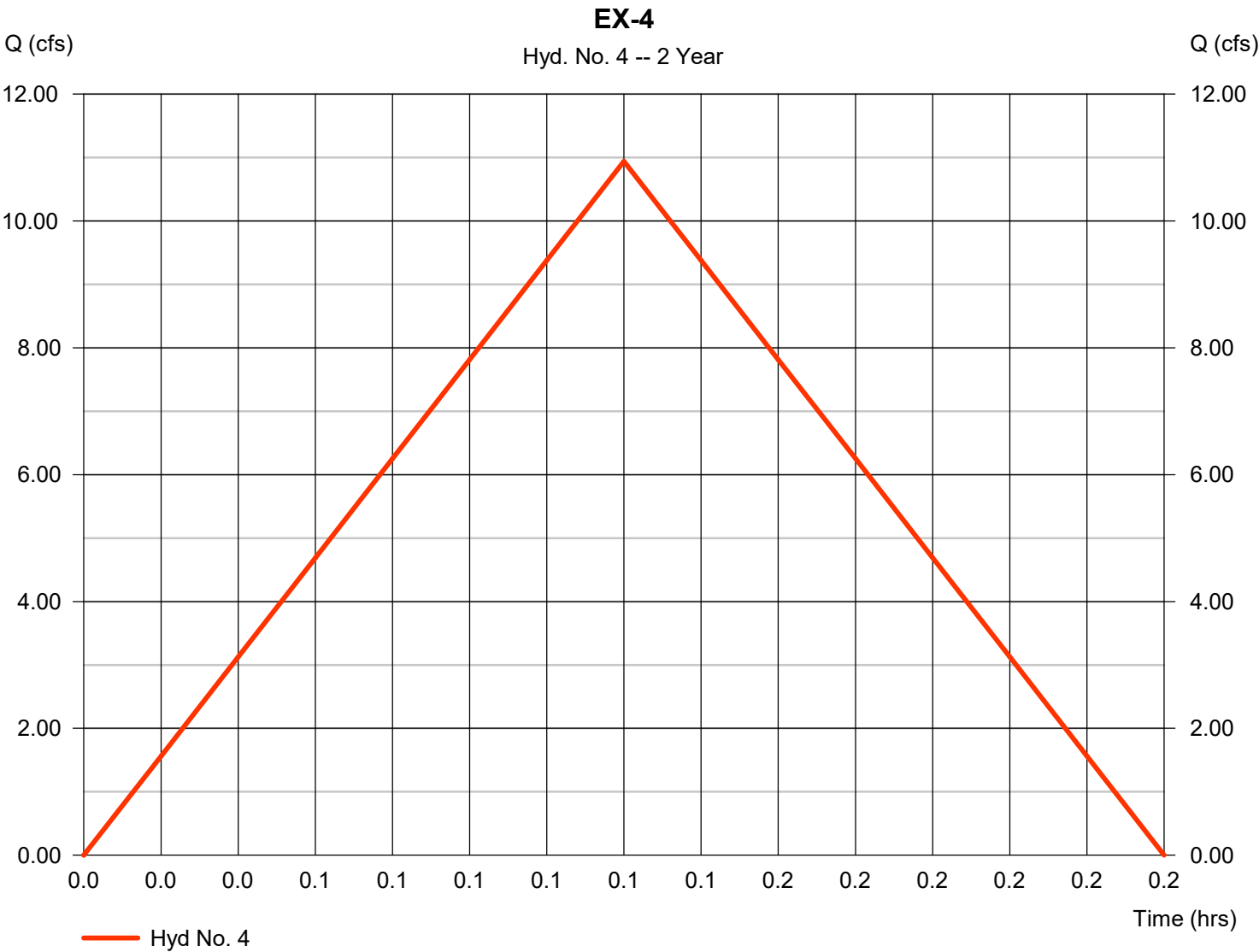


Hydrograph Report

Hyd. No. 4

EX-4

Hydrograph type	= Rational	Peak discharge	= 10.94 cfs
Storm frequency	= 2 yrs	Time to peak	= 0.12 hrs
Time interval	= 1 min	Hyd. volume	= 4,595 cuft
Drainage area	= 2.300 ac	Runoff coeff.	= 0.9
Intensity	= 5.286 in/hr	Tc by User	= 7.00 min
IDF Curve	= OKC, OK IDF.IDF	Asc/Rec limb fact	= 1/1

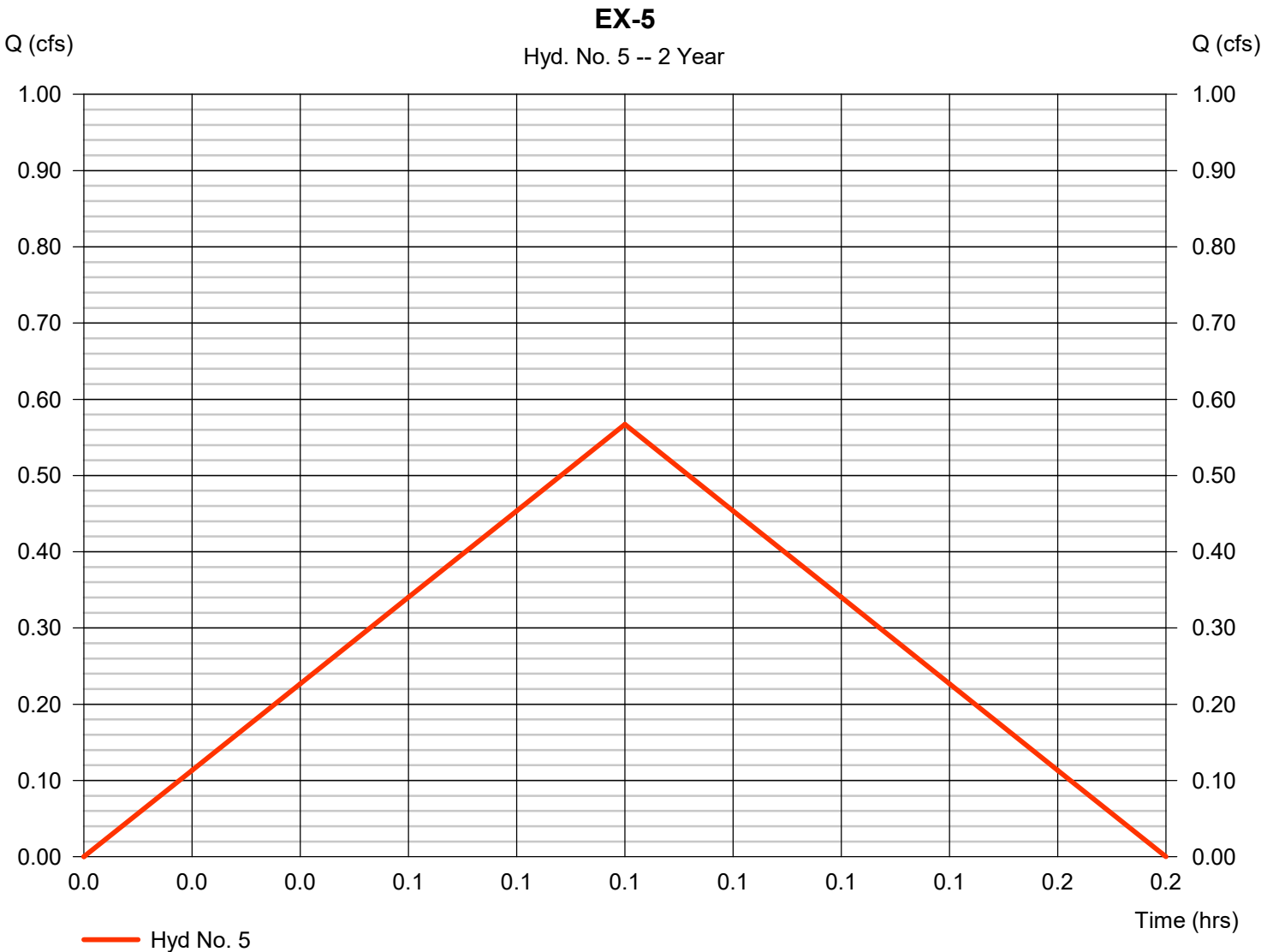


Hydrograph Report

Hyd. No. 5

EX-5

Hydrograph type	= Rational	Peak discharge	= 0.567 cfs
Storm frequency	= 2 yrs	Time to peak	= 0.08 hrs
Time interval	= 1 min	Hyd. volume	= 170 cuft
Drainage area	= 0.110 ac	Runoff coeff.	= 0.9
Intensity	= 5.728 in/hr	Tc by User	= 5.00 min
IDF Curve	= OKC, OK IDF.IDF	Asc/Rec limb fact	= 1/1

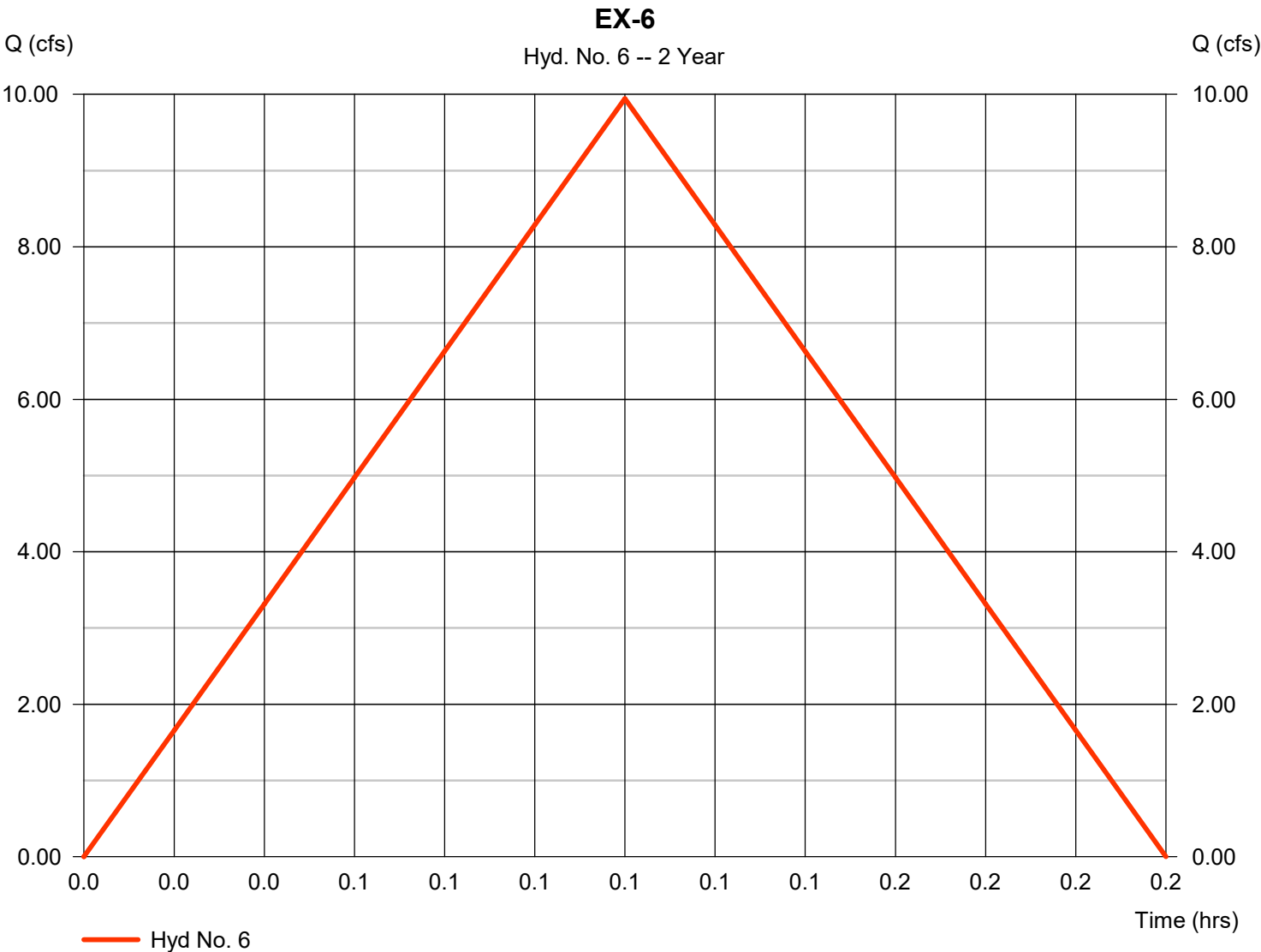


Hydrograph Report

Hyd. No. 6

EX-6

Hydrograph type	= Rational	Peak discharge	= 9.945 cfs
Storm frequency	= 2 yrs	Time to peak	= 0.10 hrs
Time interval	= 1 min	Hyd. volume	= 3,580 cuft
Drainage area	= 2.010 ac	Runoff coeff.	= 0.9
Intensity	= 5.498 in/hr	Tc by User	= 6.00 min
IDF Curve	= OKC, OK IDF.IDF	Asc/Rec limb fact	= 1/1

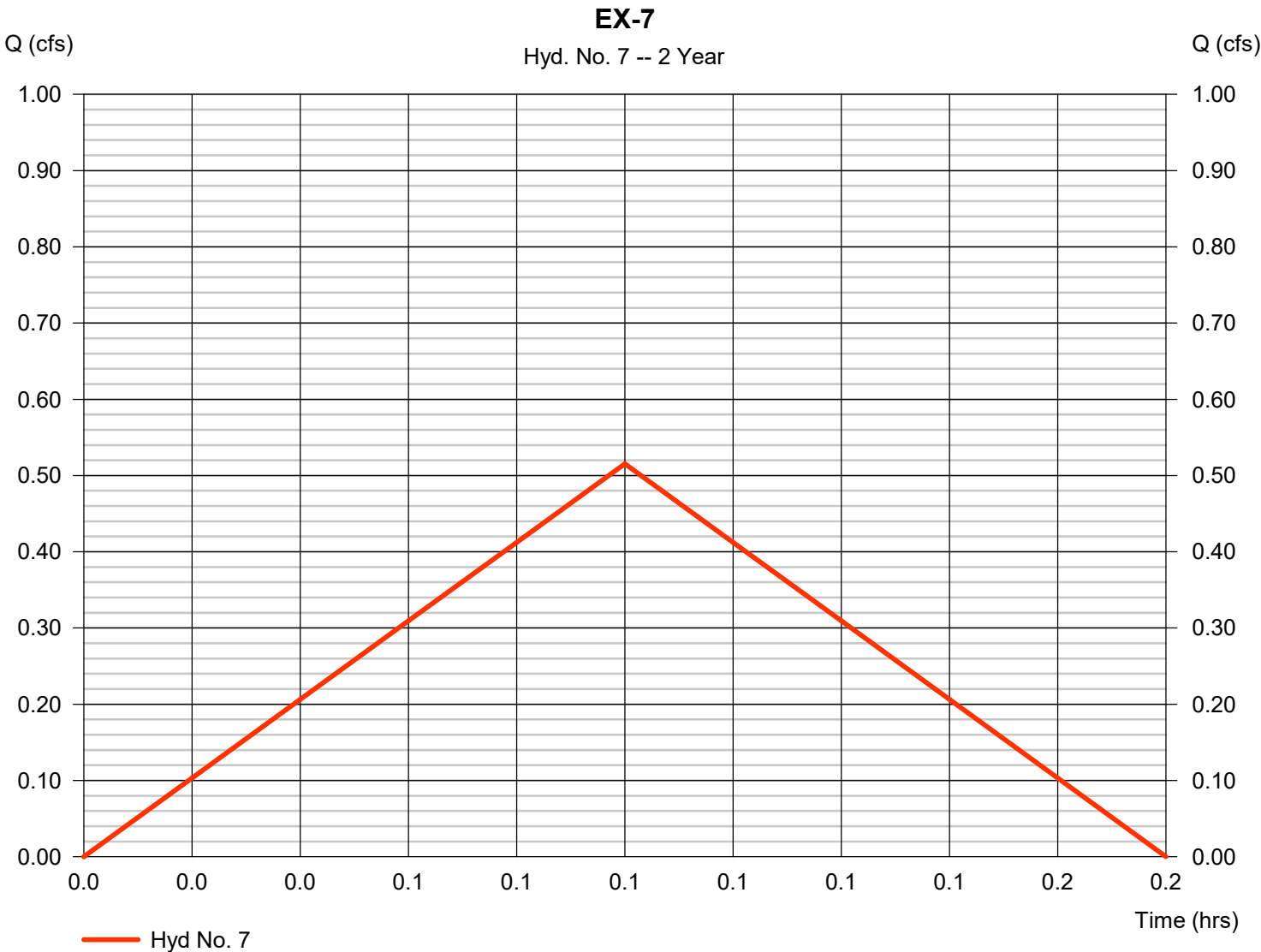


Hydrograph Report

Hyd. No. 7

EX-7

Hydrograph type	= Rational	Peak discharge	= 0.515 cfs
Storm frequency	= 2 yrs	Time to peak	= 0.08 hrs
Time interval	= 1 min	Hyd. volume	= 155 cuft
Drainage area	= 0.100 ac	Runoff coeff.	= 0.9
Intensity	= 5.728 in/hr	Tc by User	= 5.00 min
IDF Curve	= OKC, OK IDF.IDF	Asc/Rec limb fact	= 1/1

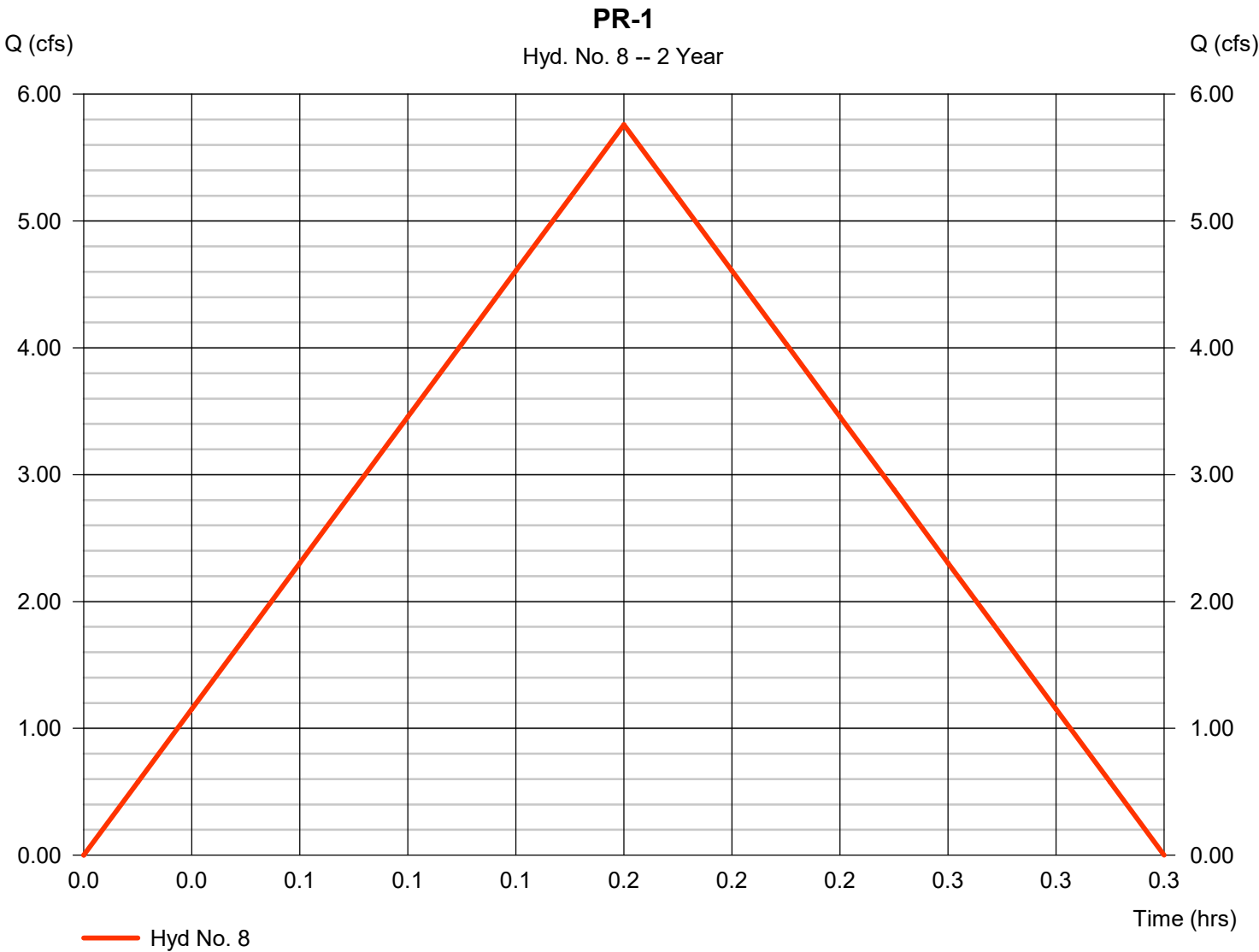


Hydrograph Report

Hyd. No. 8

PR-1

Hydrograph type	= Rational	Peak discharge	= 5.760 cfs
Storm frequency	= 2 yrs	Time to peak	= 0.17 hrs
Time interval	= 1 min	Hyd. volume	= 3,456 cuft
Drainage area	= 1.350 ac	Runoff coeff.	= 0.9
Intensity	= 4.741 in/hr	Tc by User	= 10.00 min
IDF Curve	= OKC, OK IDF.IDF	Asc/Rec limb fact	= 1/1

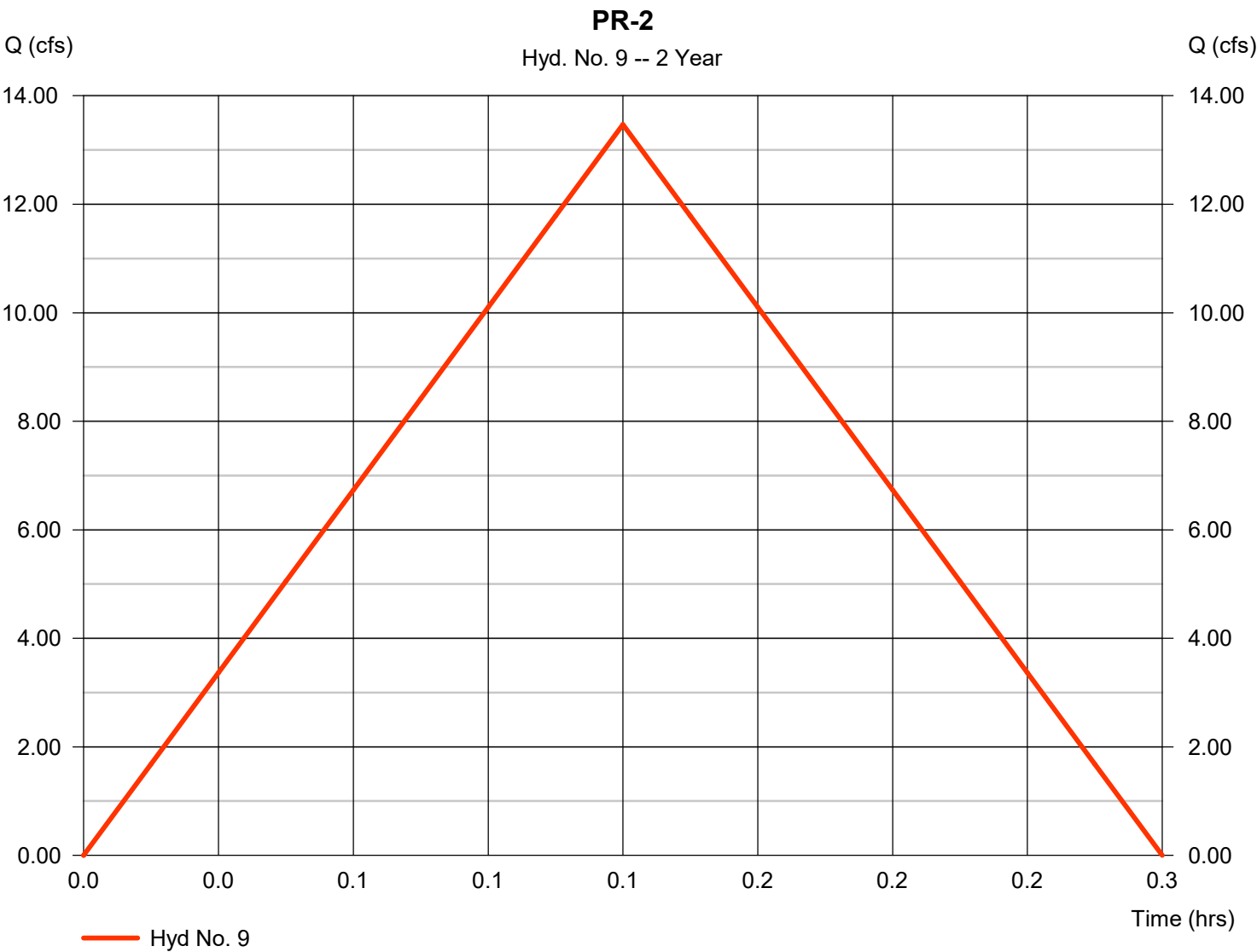


Hydrograph Report

Hyd. No. 9

PR-2

Hydrograph type	= Rational	Peak discharge	= 13.47 cfs
Storm frequency	= 2 yrs	Time to peak	= 0.13 hrs
Time interval	= 1 min	Hyd. volume	= 6,465 cuft
Drainage area	= 2.940 ac	Runoff coeff.	= 0.9
Intensity	= 5.090 in/hr	Tc by User	= 8.00 min
IDF Curve	= OKC, OK IDF.IDF	Asc/Rec limb fact	= 1/1

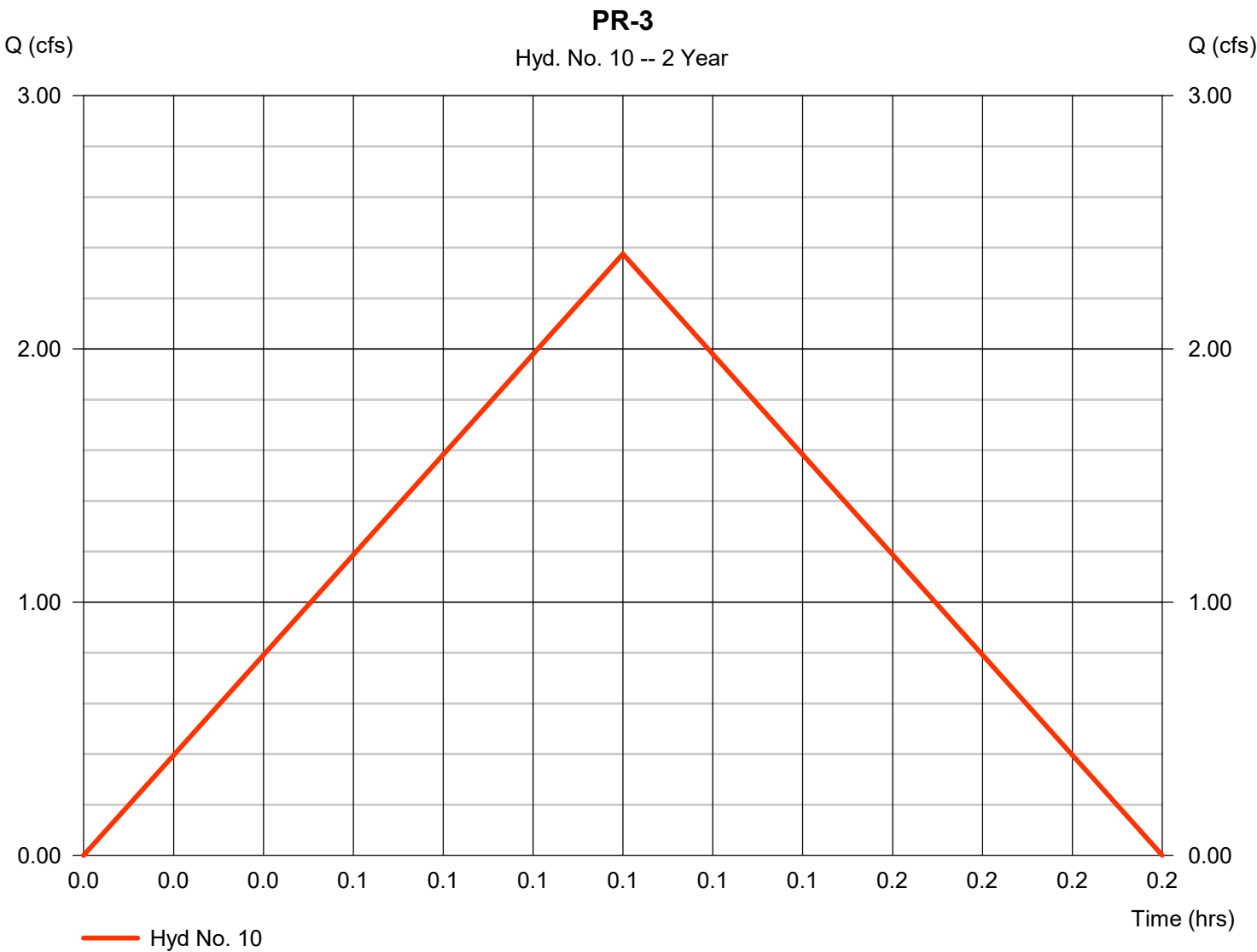


Hydrograph Report

Hyd. No. 10

PR-3

Hydrograph type	= Rational	Peak discharge	= 2.375 cfs
Storm frequency	= 2 yrs	Time to peak	= 0.10 hrs
Time interval	= 1 min	Hyd. volume	= 855 cuft
Drainage area	= 0.480 ac	Runoff coeff.	= 0.9
Intensity	= 5.498 in/hr	Tc by User	= 6.00 min
IDF Curve	= OKC, OK IDF.IDF	Asc/Rec limb fact	= 1/1

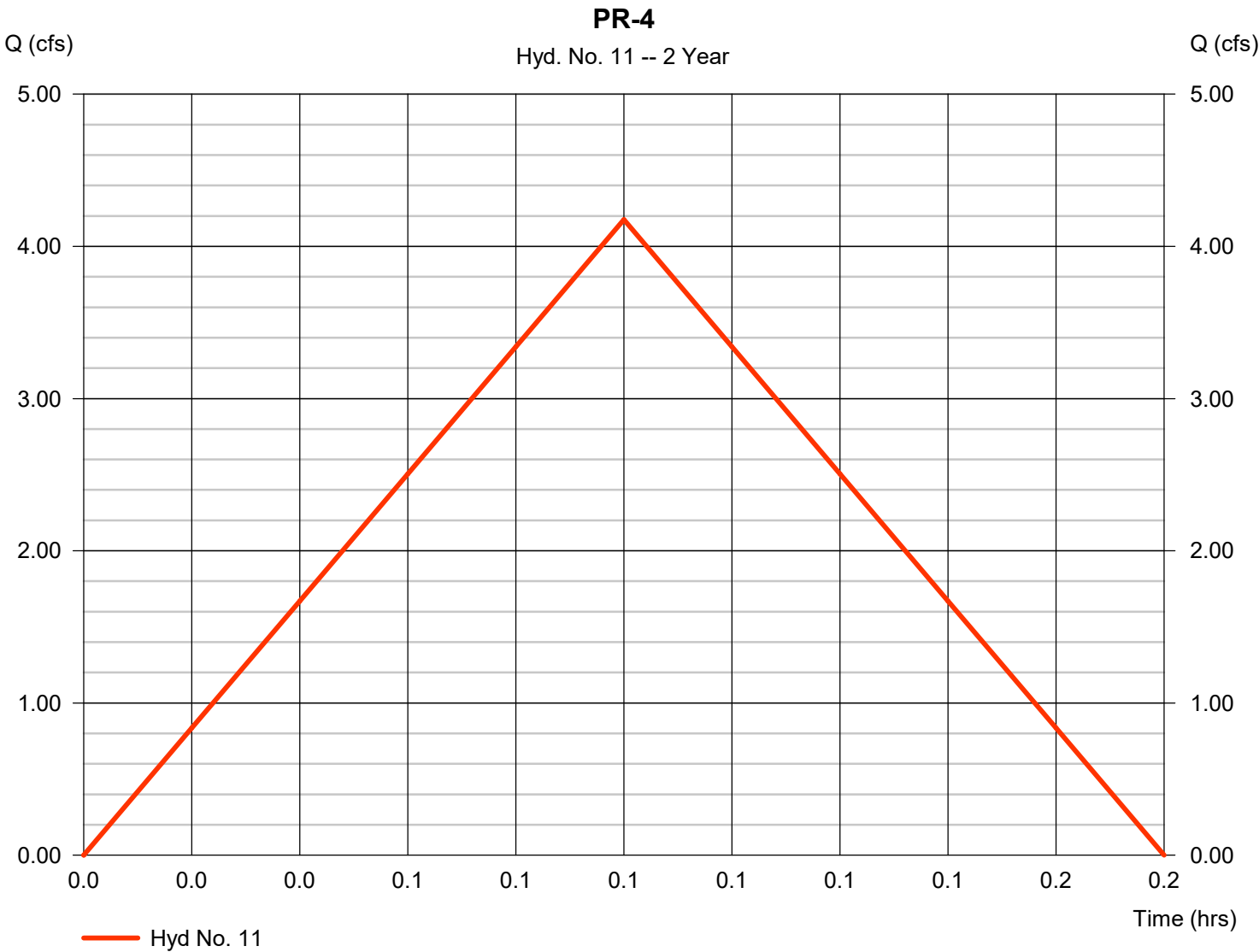


Hydrograph Report

Hyd. No. 11

PR-4

Hydrograph type	= Rational	Peak discharge	= 4.176 cfs
Storm frequency	= 2 yrs	Time to peak	= 0.08 hrs
Time interval	= 1 min	Hyd. volume	= 1,253 cuft
Drainage area	= 0.810 ac	Runoff coeff.	= 0.9
Intensity	= 5.728 in/hr	Tc by User	= 5.00 min
IDF Curve	= OKC, OK IDF.IDF	Asc/Rec limb fact	= 1/1

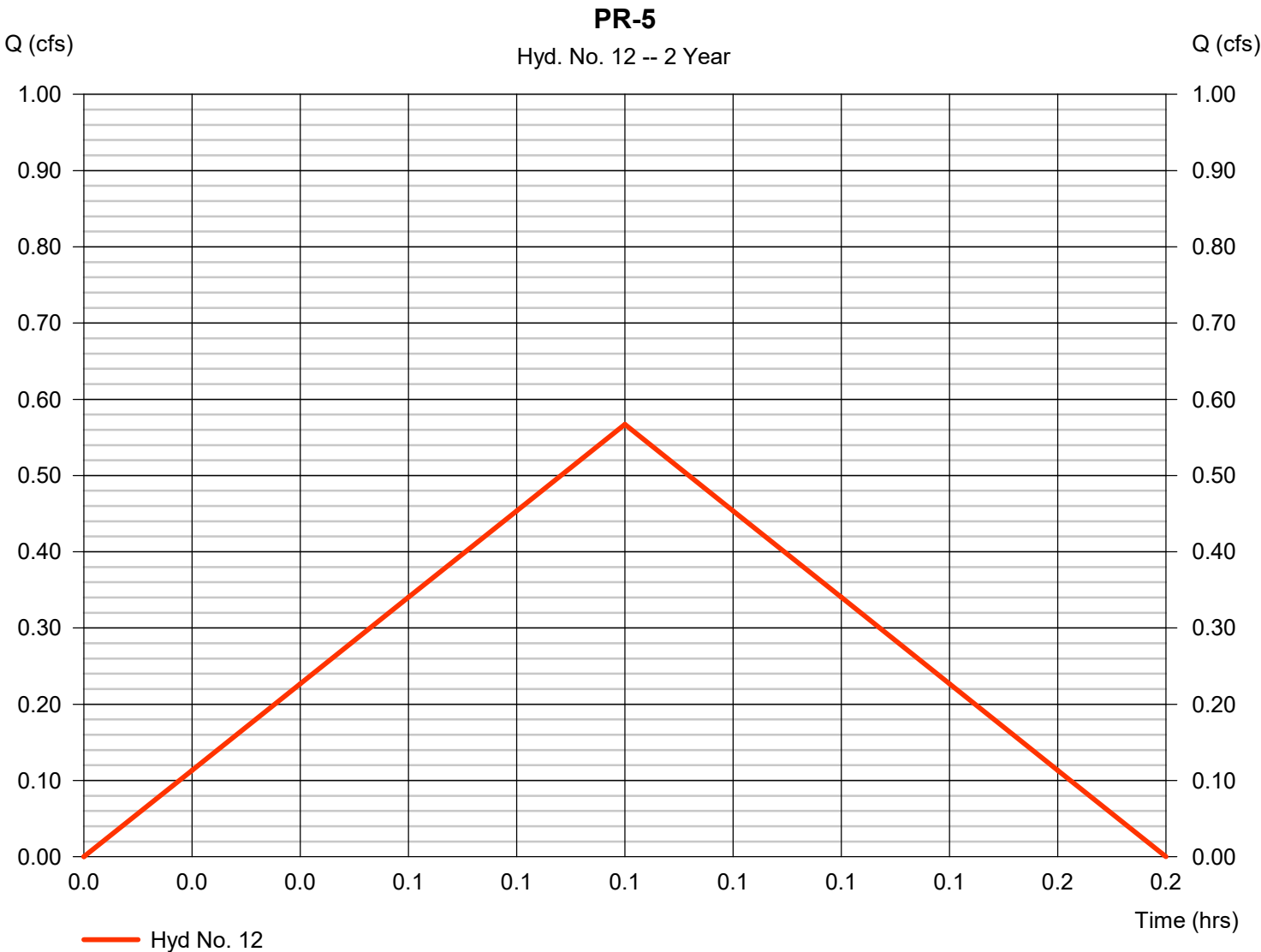


Hydrograph Report

Hyd. No. 12

PR-5

Hydrograph type	= Rational	Peak discharge	= 0.567 cfs
Storm frequency	= 2 yrs	Time to peak	= 0.08 hrs
Time interval	= 1 min	Hyd. volume	= 170 cuft
Drainage area	= 0.110 ac	Runoff coeff.	= 0.9
Intensity	= 5.728 in/hr	Tc by User	= 5.00 min
IDF Curve	= OKC, OK IDF.IDF	Asc/Rec limb fact	= 1/1

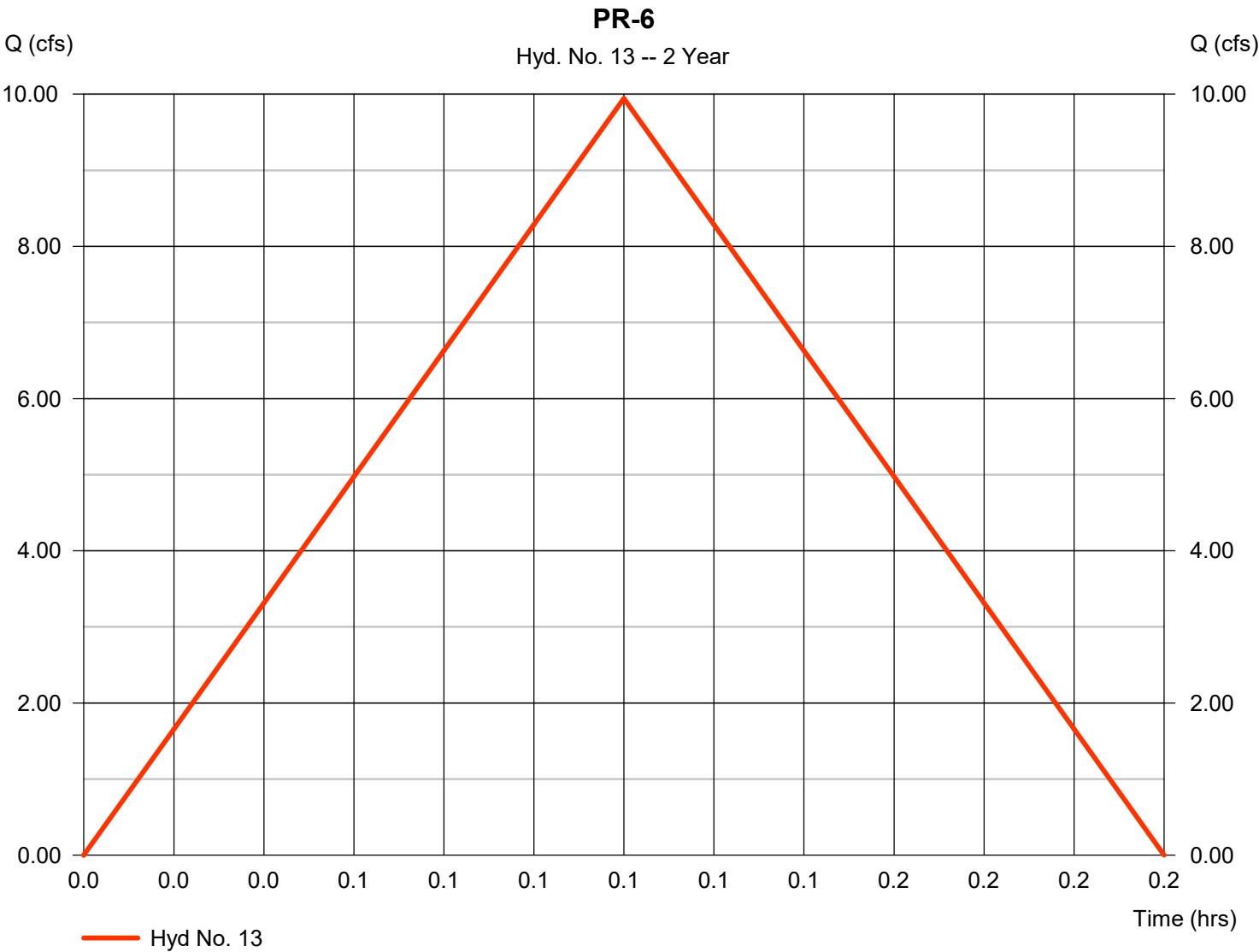


Hydrograph Report

Hyd. No. 13

PR-6

Hydrograph type	= Rational	Peak discharge	= 9.945 cfs
Storm frequency	= 2 yrs	Time to peak	= 0.10 hrs
Time interval	= 1 min	Hyd. volume	= 3,580 cuft
Drainage area	= 2.010 ac	Runoff coeff.	= 0.9
Intensity	= 5.498 in/hr	Tc by User	= 6.00 min
IDF Curve	= OKC, OK IDF.IDF	Asc/Rec limb fact	= 1/1

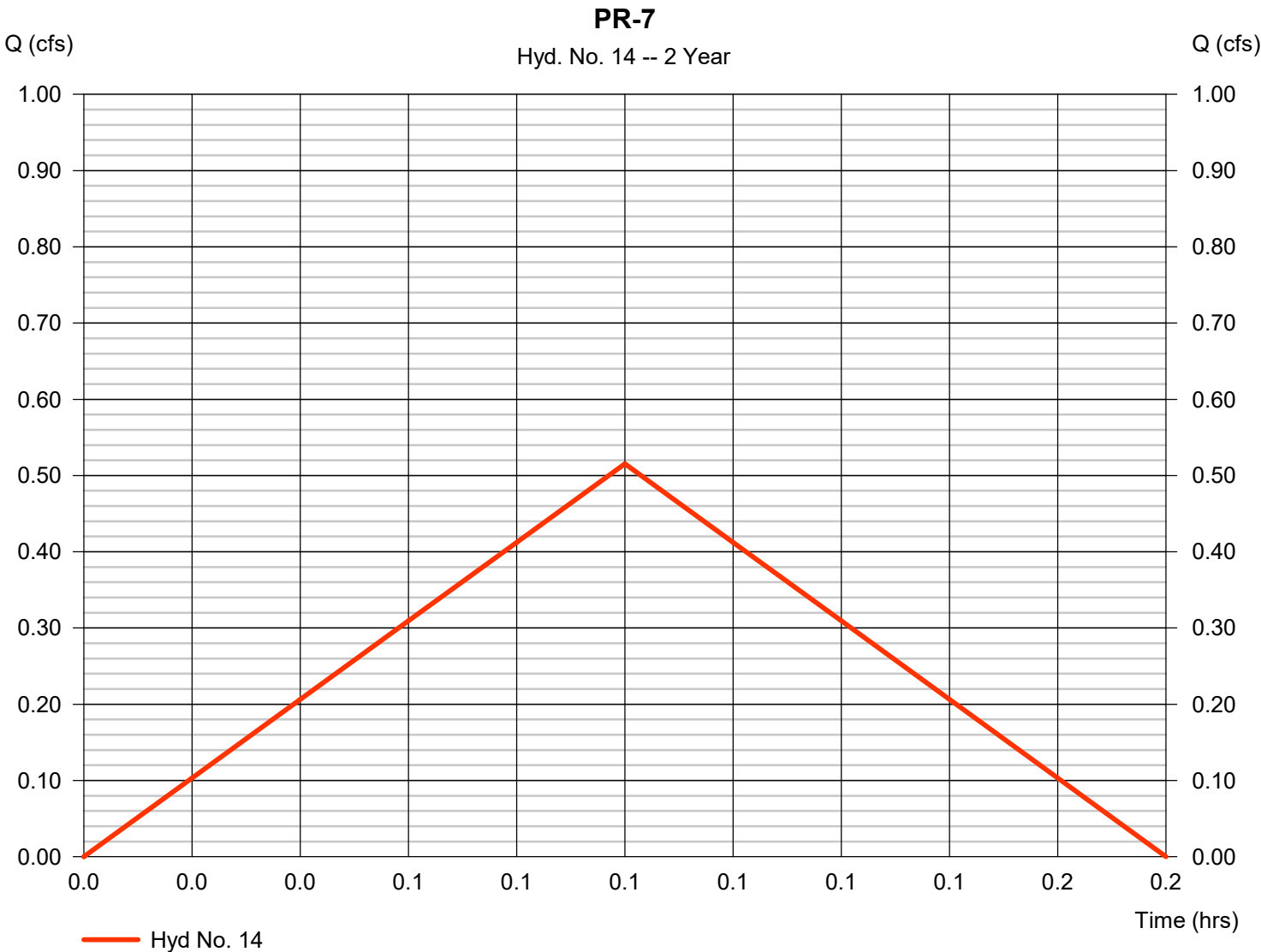


Hydrograph Report

Hyd. No. 14

PR-7

Hydrograph type	= Rational	Peak discharge	= 0.515 cfs
Storm frequency	= 2 yrs	Time to peak	= 0.08 hrs
Time interval	= 1 min	Hyd. volume	= 155 cuft
Drainage area	= 0.100 ac	Runoff coeff.	= 0.9
Intensity	= 5.728 in/hr	Tc by User	= 5.00 min
IDF Curve	= OKC, OK IDF.IDF	Asc/Rec limb fact	= 1/1

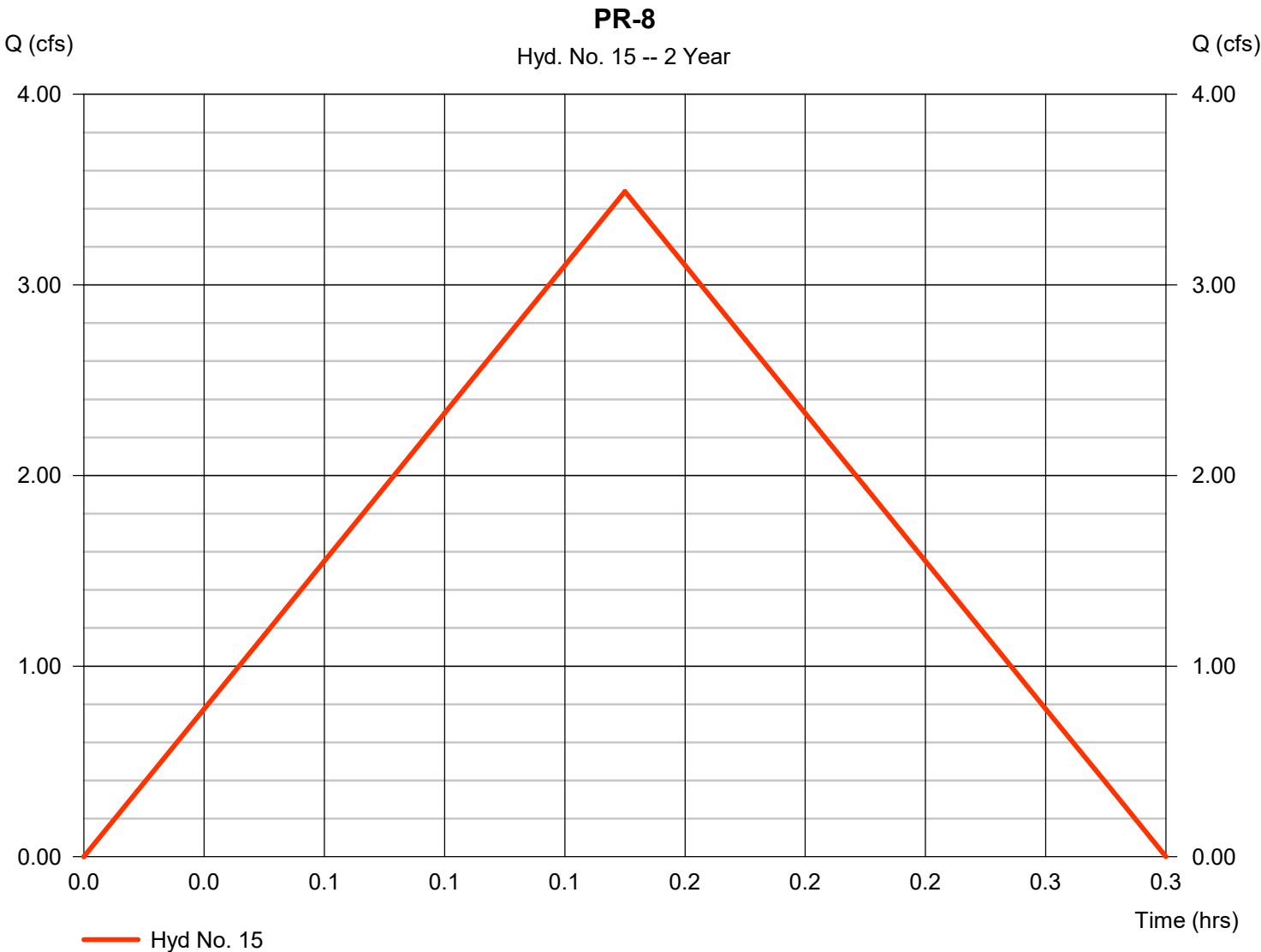


Hydrograph Report

Hyd. No. 15

PR-8

Hydrograph type	= Rational	Peak discharge	= 3.490 cfs
Storm frequency	= 2 yrs	Time to peak	= 0.15 hrs
Time interval	= 1 min	Hyd. volume	= 1,885 cuft
Drainage area	= 0.790 ac	Runoff coeff.	= 0.9
Intensity	= 4.909 in/hr	Tc by User	= 9.00 min
IDF Curve	= OKC, OK IDF.IDF	Asc/Rec limb fact	= 1/1

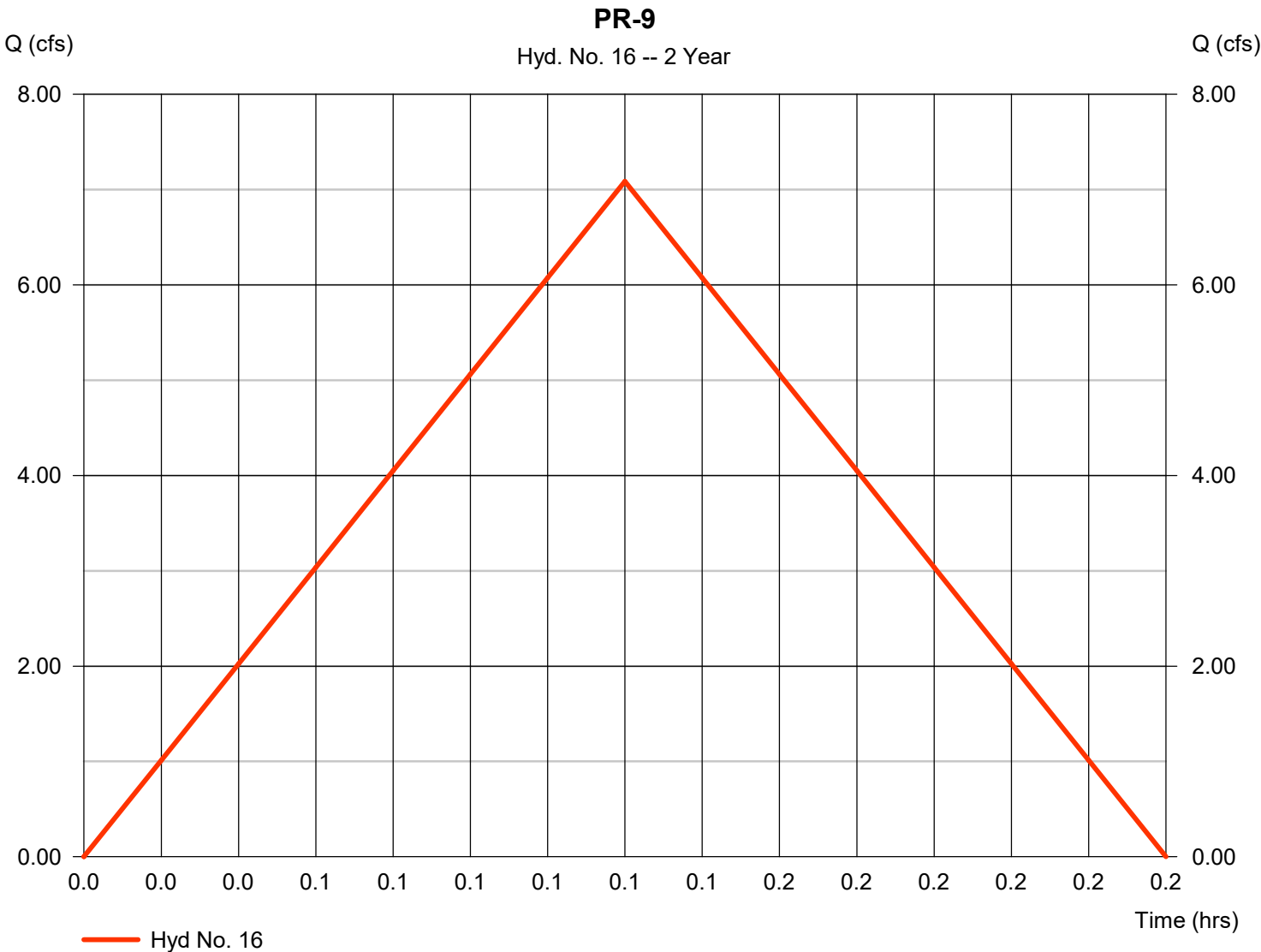


Hydrograph Report

Hyd. No. 16

PR-9

Hydrograph type	= Rational	Peak discharge	= 7.088 cfs
Storm frequency	= 2 yrs	Time to peak	= 0.12 hrs
Time interval	= 1 min	Hyd. volume	= 2,977 cuft
Drainage area	= 1.490 ac	Runoff coeff.	= 0.9
Intensity	= 5.286 in/hr	Tc by User	= 7.00 min
IDF Curve	= OKC, OK IDF.IDF	Asc/Rec limb fact	= 1/1



Hydrograph Summary Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2022

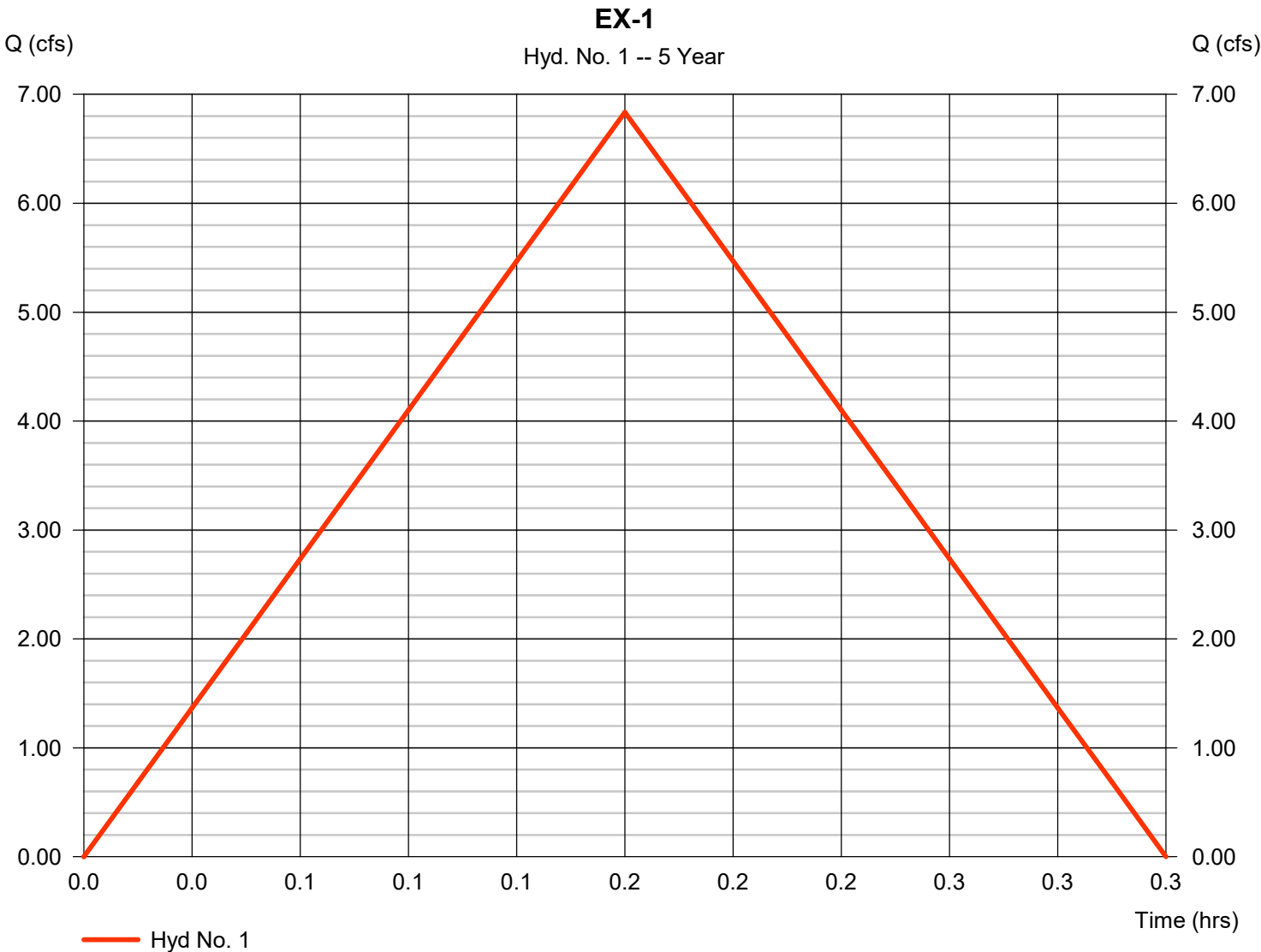
Hyd. No.	Hydrograph type (origin)	Peak flow (cfs)	Time interval (min)	Time to Peak (min)	Hyd. volume (cuft)	Inflow hyd(s)	Maximum elevation (ft)	Total strge used (cuft)	Hydrograph Description
1	Rational	6.836	1	10	4,102	-----	-----	-----	EX-1
2	Rational	15.96	1	8	7,659	-----	-----	-----	EX-2
3	Rational	6.431	1	10	3,858	-----	-----	-----	EX-3
4	Rational	12.95	1	7	5,440	-----	-----	-----	EX-4
5	Rational	0.671	1	5	201	-----	-----	-----	EX-5
6	Rational	11.77	1	6	4,236	-----	-----	-----	EX-6
7	Rational	0.610	1	5	183	-----	-----	-----	EX-7
8	Rational	6.836	1	10	4,102	-----	-----	-----	PR-1
9	Rational	15.96	1	8	7,659	-----	-----	-----	PR-2
10	Rational	2.810	1	6	1,011	-----	-----	-----	PR-3
11	Rational	4.938	1	5	1,481	-----	-----	-----	PR-4
12	Rational	0.671	1	5	201	-----	-----	-----	PR-5
13	Rational	11.77	1	6	4,236	-----	-----	-----	PR-6
14	Rational	0.610	1	5	183	-----	-----	-----	PR-7
15	Rational	4.138	1	9	2,235	-----	-----	-----	PR-8
16	Rational	8.391	1	7	3,524	-----	-----	-----	PR-9
Flows.gpw					Return Period: 5 Year			Friday, 02 / 11 / 2022	

Hydrograph Report

Hyd. No. 1

EX-1

Hydrograph type	= Rational	Peak discharge	= 6.836 cfs
Storm frequency	= 5 yrs	Time to peak	= 0.17 hrs
Time interval	= 1 min	Hyd. volume	= 4,102 cuft
Drainage area	= 1.350 ac	Runoff coeff.	= 0.9
Intensity	= 5.626 in/hr	Tc by User	= 10.00 min
IDF Curve	= OKC, OK IDF.IDF	Asc/Rec limb fact	= 1/1

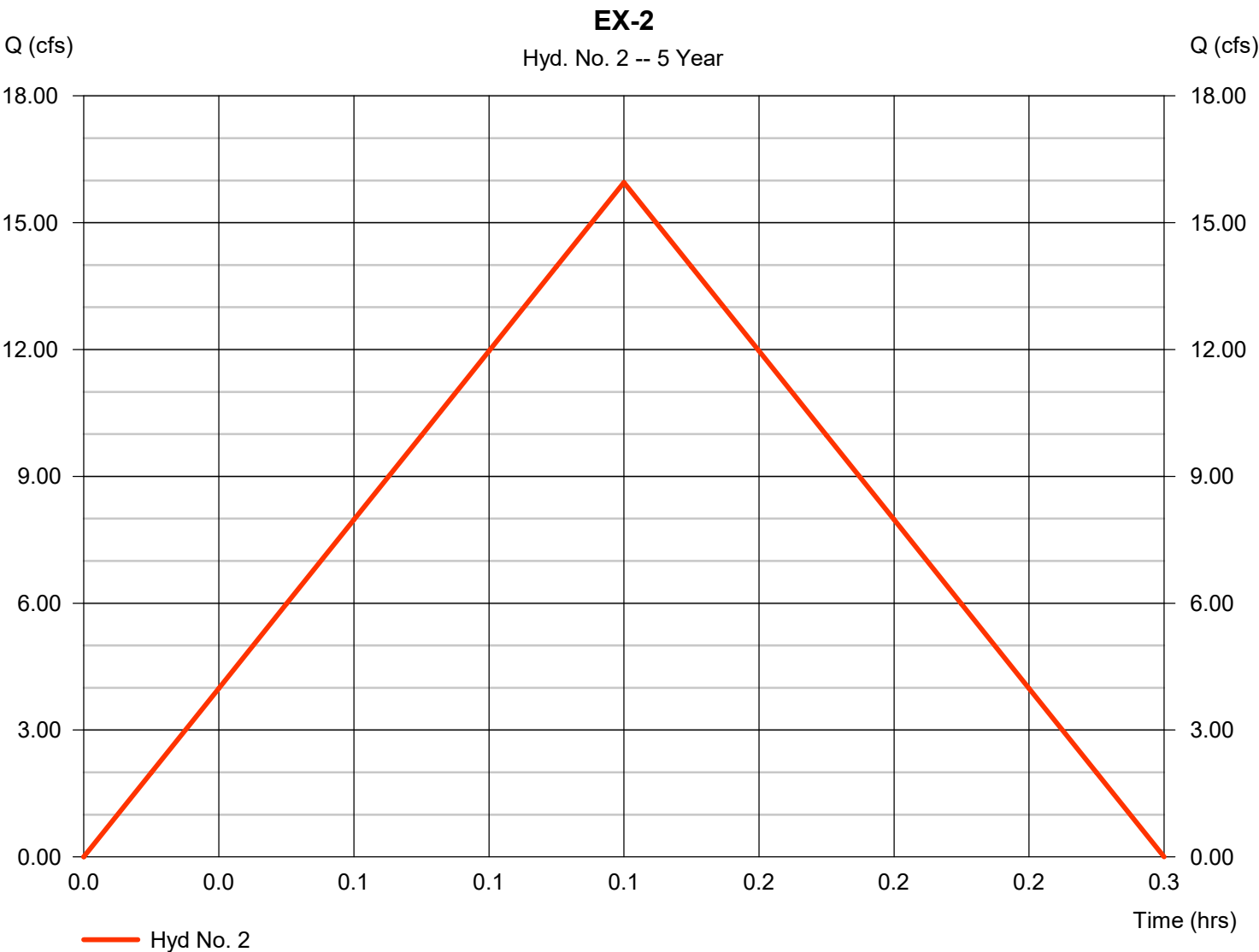


Hydrograph Report

Hyd. No. 2

EX-2

Hydrograph type	= Rational	Peak discharge	= 15.96 cfs
Storm frequency	= 5 yrs	Time to peak	= 0.13 hrs
Time interval	= 1 min	Hyd. volume	= 7,659 cuft
Drainage area	= 2.940 ac	Runoff coeff.	= 0.9
Intensity	= 6.030 in/hr	Tc by User	= 8.00 min
IDF Curve	= OKC, OK IDF.IDF	Asc/Rec limb fact	= 1/1

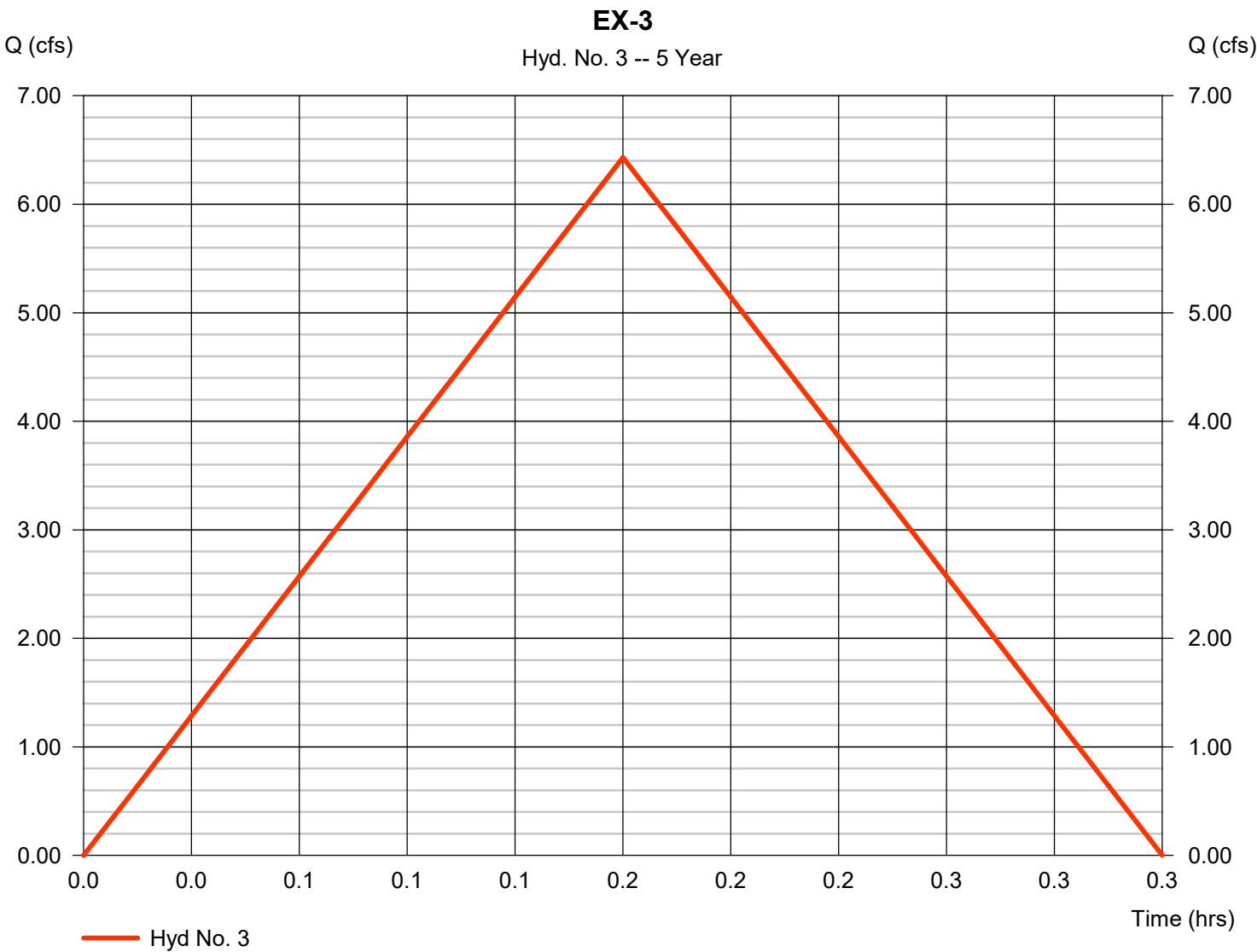


Hydrograph Report

Hyd. No. 3

EX-3

Hydrograph type	= Rational	Peak discharge	= 6.431 cfs
Storm frequency	= 5 yrs	Time to peak	= 0.17 hrs
Time interval	= 1 min	Hyd. volume	= 3,858 cuft
Drainage area	= 1.270 ac	Runoff coeff.	= 0.9
Intensity	= 5.626 in/hr	Tc by User	= 10.00 min
IDF Curve	= OKC, OK IDF.IDF	Asc/Rec limb fact	= 1/1

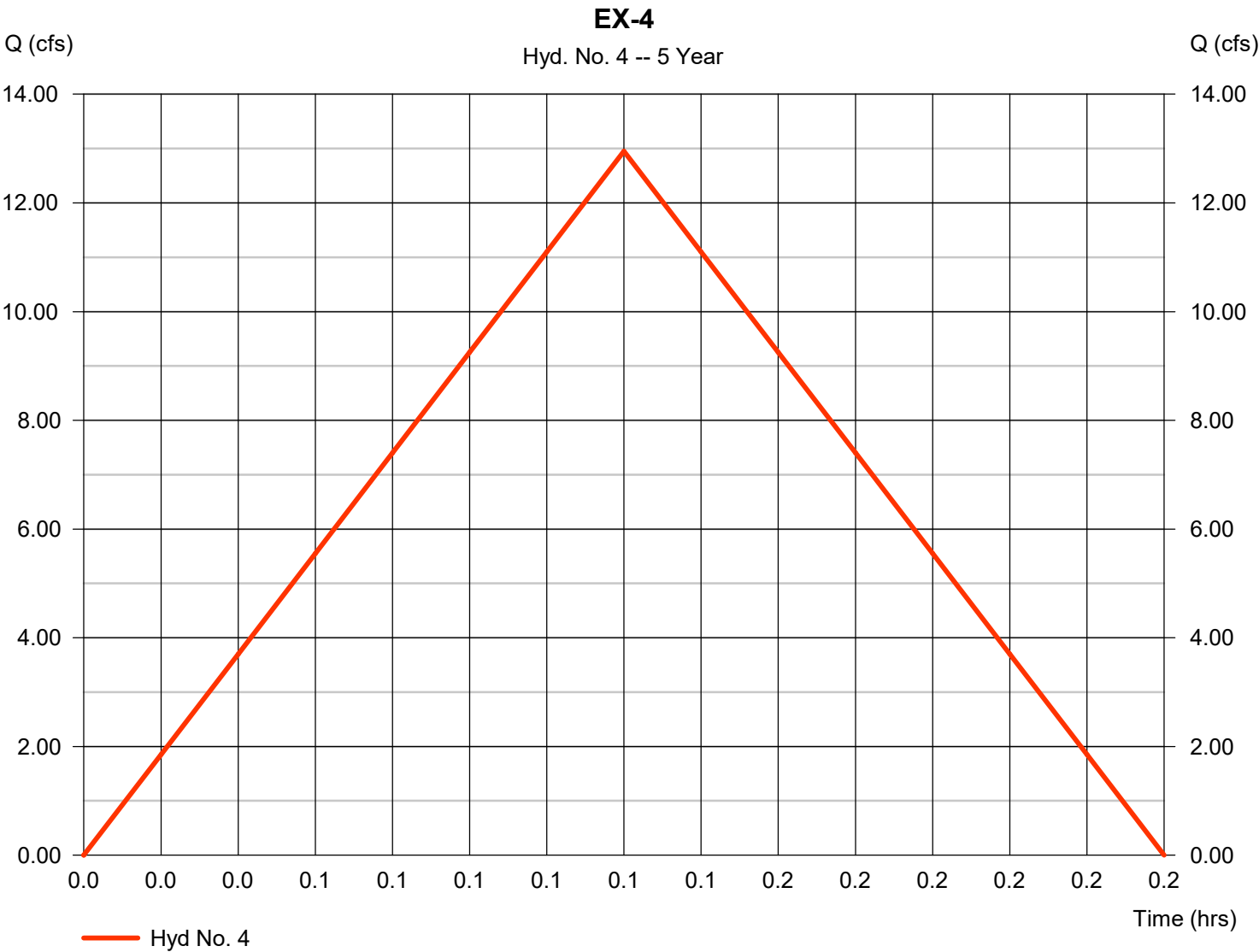


Hydrograph Report

Hyd. No. 4

EX-4

Hydrograph type	= Rational	Peak discharge	= 12.95 cfs
Storm frequency	= 5 yrs	Time to peak	= 0.12 hrs
Time interval	= 1 min	Hyd. volume	= 5,440 cuft
Drainage area	= 2.300 ac	Runoff coeff.	= 0.9
Intensity	= 6.257 in/hr	Tc by User	= 7.00 min
IDF Curve	= OKC, OK IDF.IDF	Asc/Rec limb fact	= 1/1

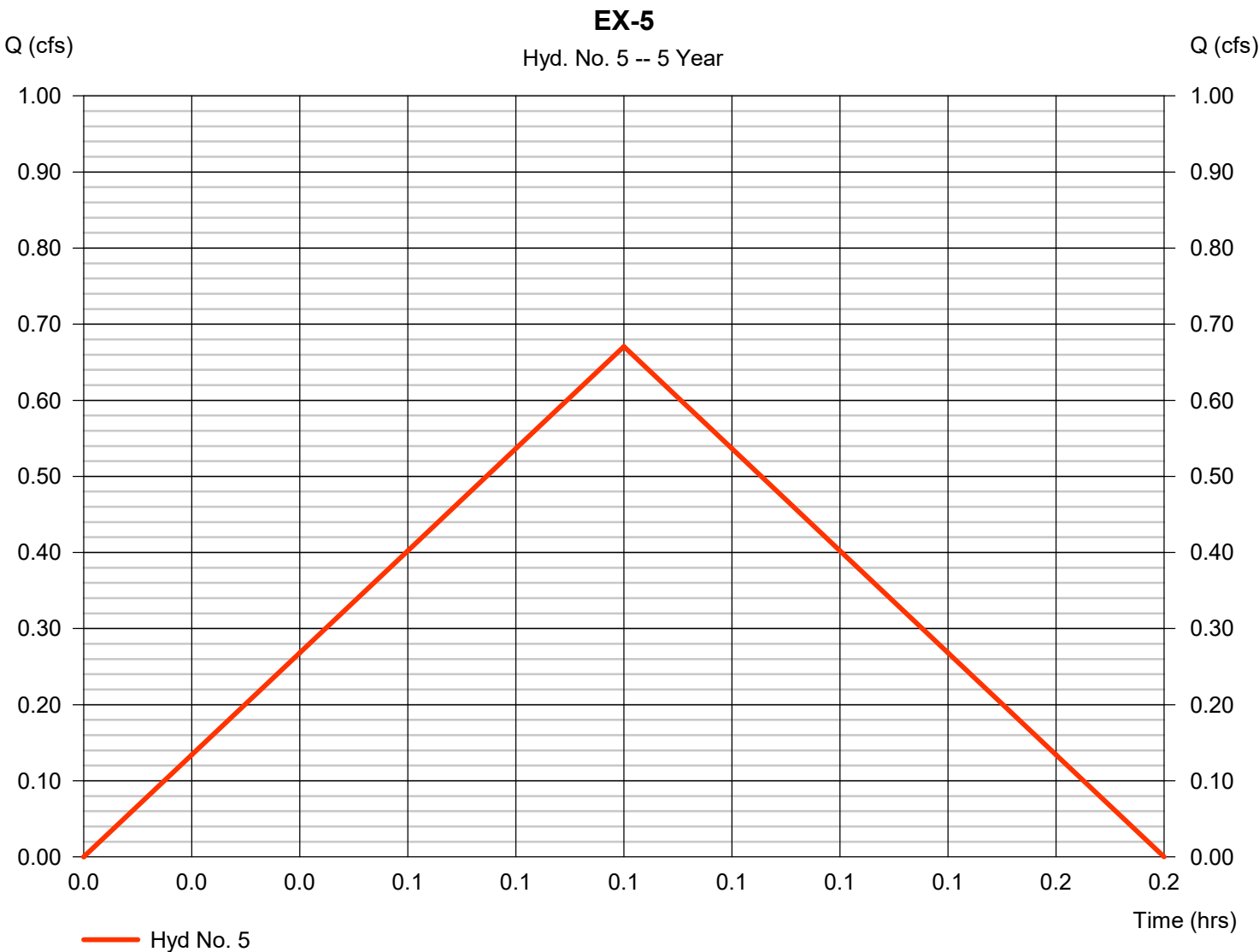


Hydrograph Report

Hyd. No. 5

EX-5

Hydrograph type	= Rational	Peak discharge	= 0.671 cfs
Storm frequency	= 5 yrs	Time to peak	= 0.08 hrs
Time interval	= 1 min	Hyd. volume	= 201 cuft
Drainage area	= 0.110 ac	Runoff coeff.	= 0.9
Intensity	= 6.773 in/hr	Tc by User	= 5.00 min
IDF Curve	= OKC, OK IDF.IDF	Asc/Rec limb fact	= 1/1

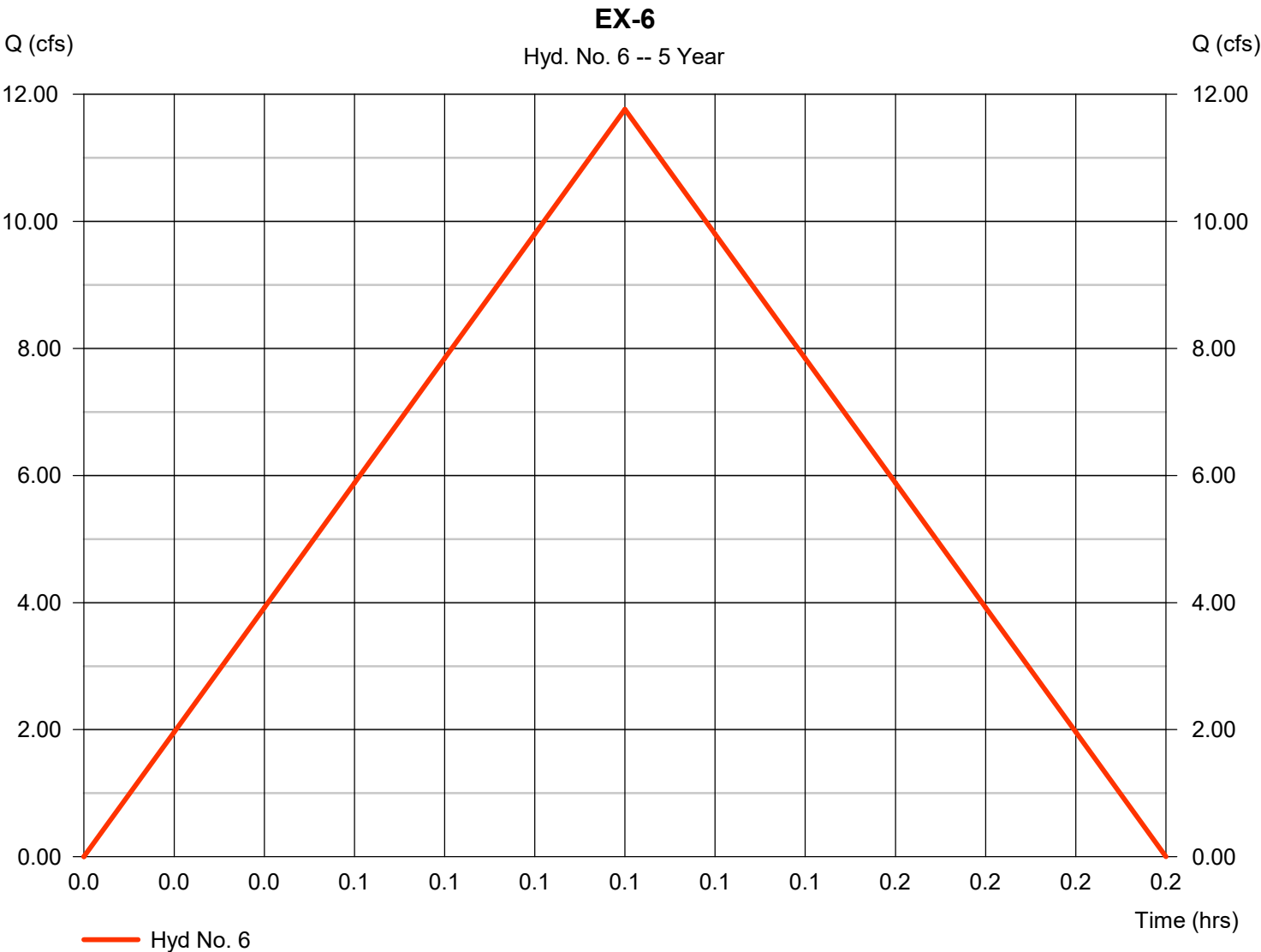


Hydrograph Report

Hyd. No. 6

EX-6

Hydrograph type	= Rational	Peak discharge	= 11.77 cfs
Storm frequency	= 5 yrs	Time to peak	= 0.10 hrs
Time interval	= 1 min	Hyd. volume	= 4,236 cuft
Drainage area	= 2.010 ac	Runoff coeff.	= 0.9
Intensity	= 6.504 in/hr	Tc by User	= 6.00 min
IDF Curve	= OKC, OK IDF.IDF	Asc/Rec limb fact	= 1/1

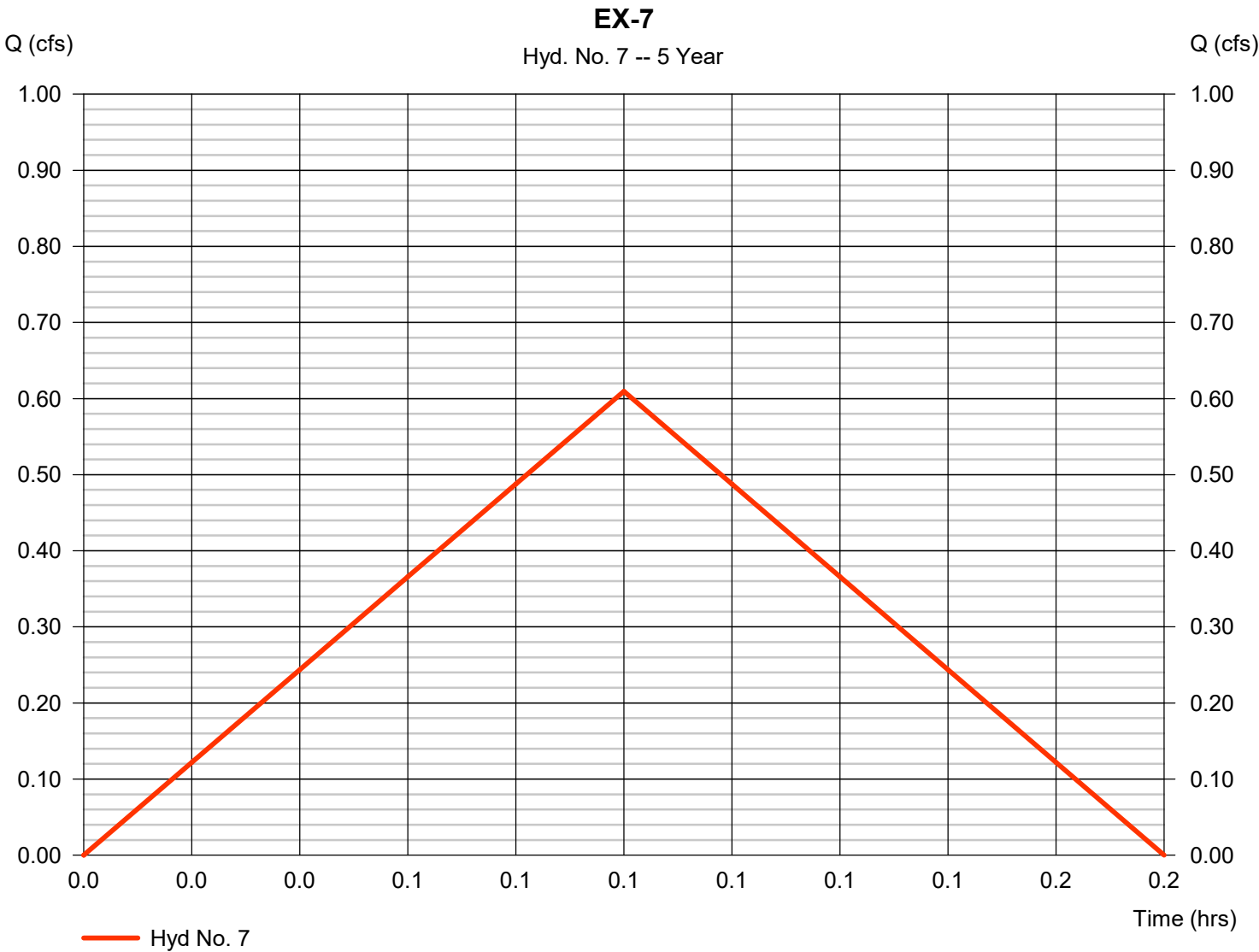


Hydrograph Report

Hyd. No. 7

EX-7

Hydrograph type	= Rational	Peak discharge	= 0.610 cfs
Storm frequency	= 5 yrs	Time to peak	= 0.08 hrs
Time interval	= 1 min	Hyd. volume	= 183 cuft
Drainage area	= 0.100 ac	Runoff coeff.	= 0.9
Intensity	= 6.773 in/hr	Tc by User	= 5.00 min
IDF Curve	= OKC, OK IDF.IDF	Asc/Rec limb fact	= 1/1

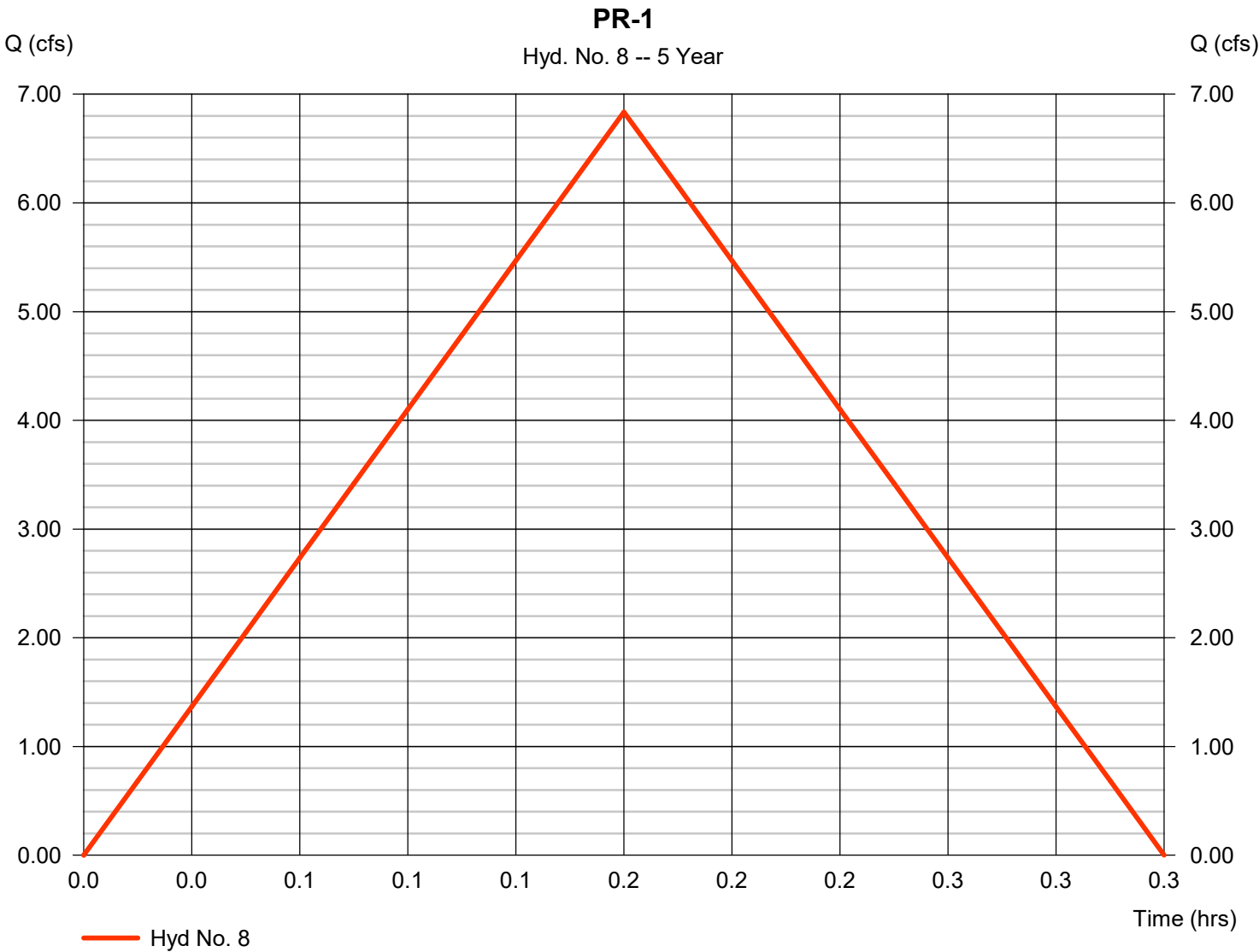


Hydrograph Report

Hyd. No. 8

PR-1

Hydrograph type	= Rational	Peak discharge	= 6.836 cfs
Storm frequency	= 5 yrs	Time to peak	= 0.17 hrs
Time interval	= 1 min	Hyd. volume	= 4,102 cuft
Drainage area	= 1.350 ac	Runoff coeff.	= 0.9
Intensity	= 5.626 in/hr	Tc by User	= 10.00 min
IDF Curve	= OKC, OK IDF.IDF	Asc/Rec limb fact	= 1/1

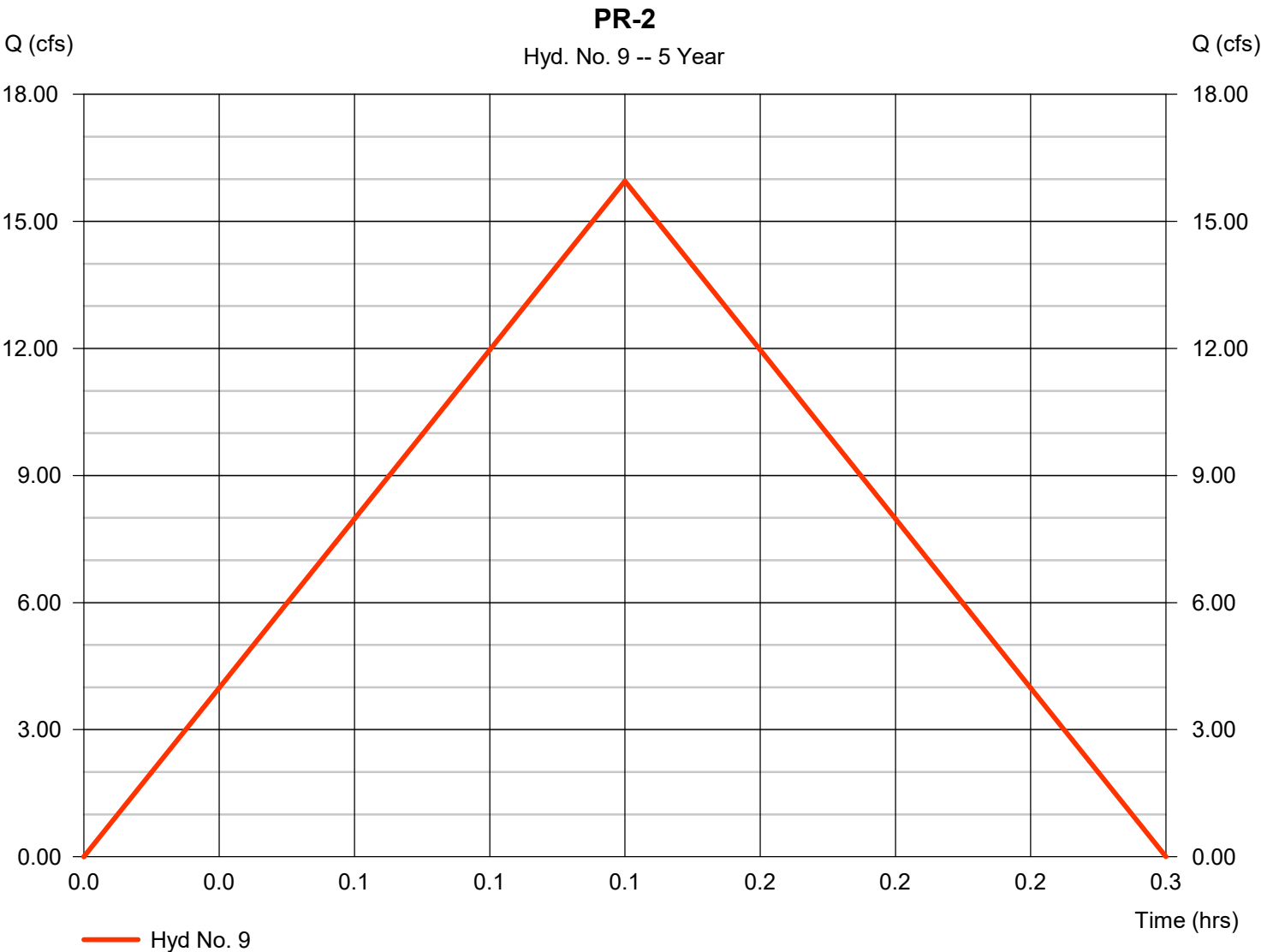


Hydrograph Report

Hyd. No. 9

PR-2

Hydrograph type	= Rational	Peak discharge	= 15.96 cfs
Storm frequency	= 5 yrs	Time to peak	= 0.13 hrs
Time interval	= 1 min	Hyd. volume	= 7,659 cuft
Drainage area	= 2.940 ac	Runoff coeff.	= 0.9
Intensity	= 6.030 in/hr	Tc by User	= 8.00 min
IDF Curve	= OKC, OK IDF.IDF	Asc/Rec limb fact	= 1/1

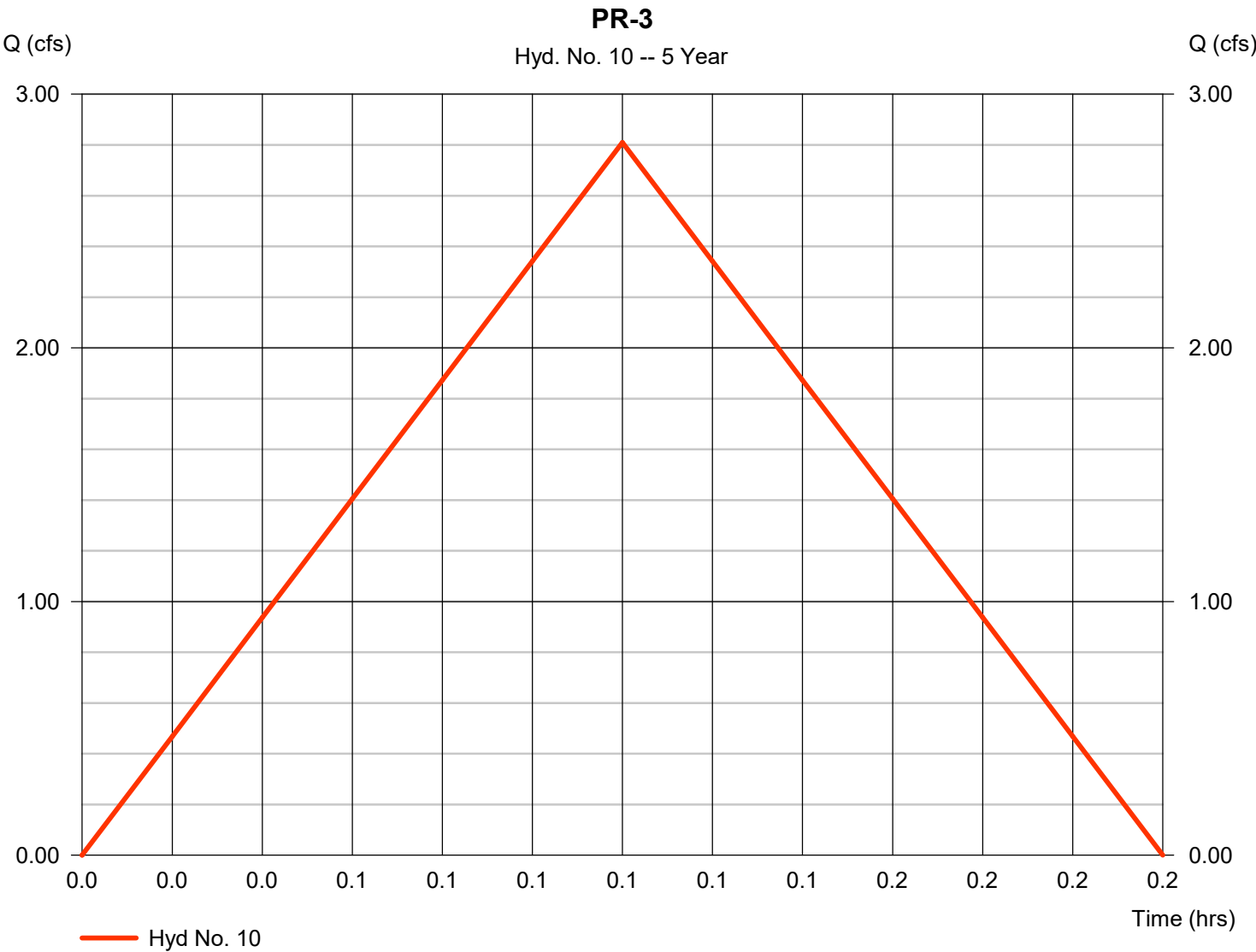


Hydrograph Report

Hyd. No. 10

PR-3

Hydrograph type	= Rational	Peak discharge	= 2.810 cfs
Storm frequency	= 5 yrs	Time to peak	= 0.10 hrs
Time interval	= 1 min	Hyd. volume	= 1,011 cuft
Drainage area	= 0.480 ac	Runoff coeff.	= 0.9
Intensity	= 6.504 in/hr	Tc by User	= 6.00 min
IDF Curve	= OKC, OK IDF.IDF	Asc/Rec limb fact	= 1/1

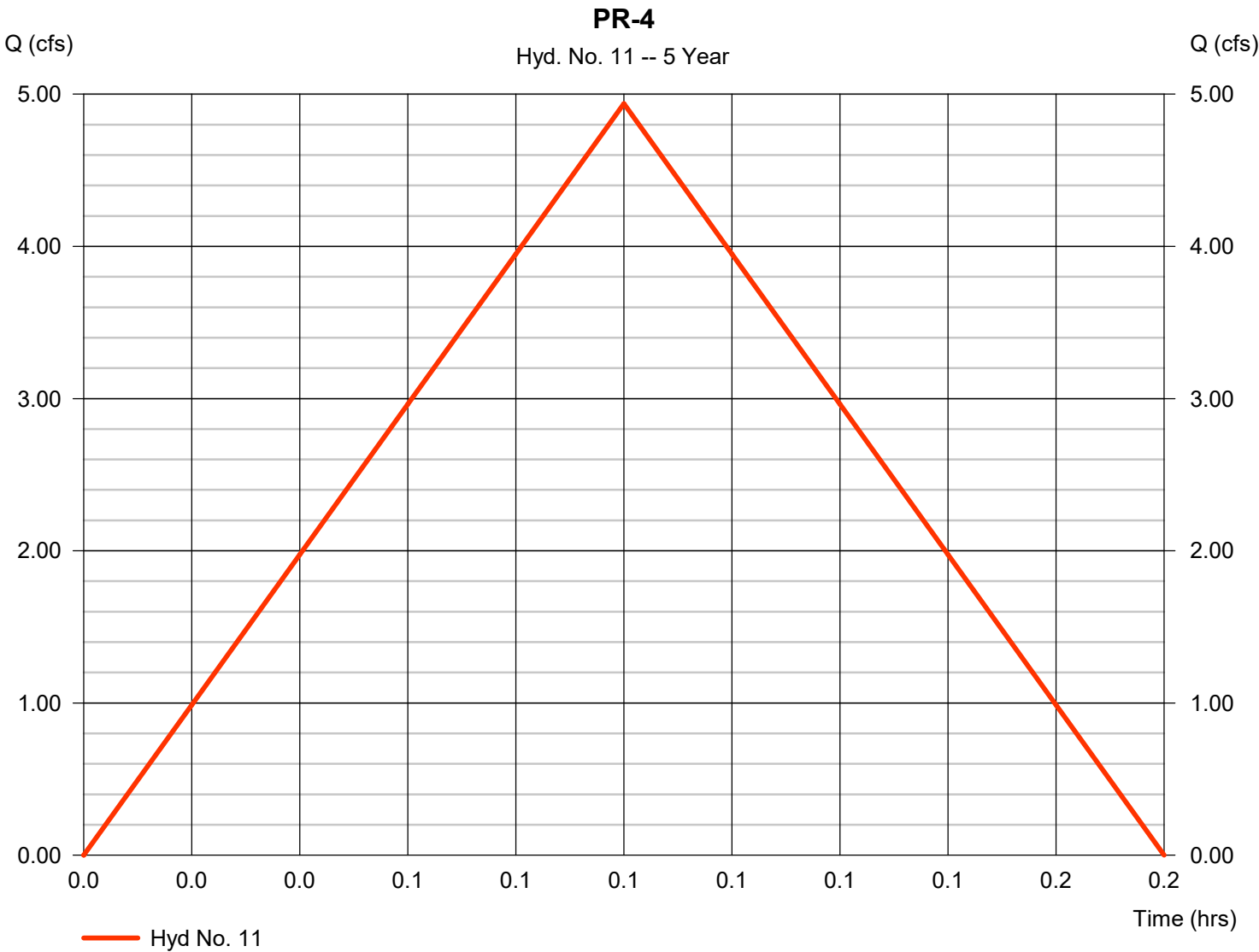


Hydrograph Report

Hyd. No. 11

PR-4

Hydrograph type	= Rational	Peak discharge	= 4.938 cfs
Storm frequency	= 5 yrs	Time to peak	= 0.08 hrs
Time interval	= 1 min	Hyd. volume	= 1,481 cuft
Drainage area	= 0.810 ac	Runoff coeff.	= 0.9
Intensity	= 6.773 in/hr	Tc by User	= 5.00 min
IDF Curve	= OKC, OK IDF.IDF	Asc/Rec limb fact	= 1/1

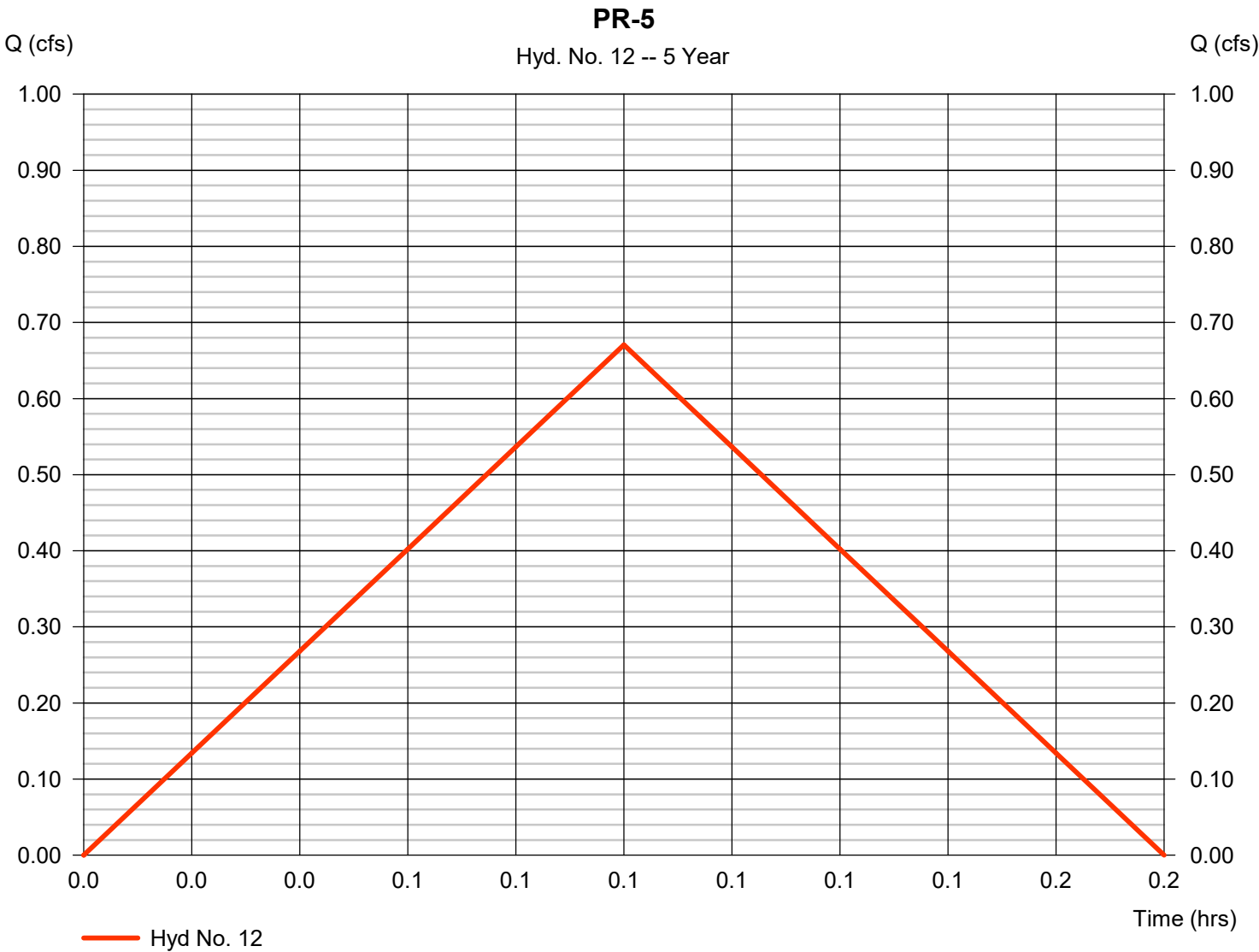


Hydrograph Report

Hyd. No. 12

PR-5

Hydrograph type	= Rational	Peak discharge	= 0.671 cfs
Storm frequency	= 5 yrs	Time to peak	= 0.08 hrs
Time interval	= 1 min	Hyd. volume	= 201 cuft
Drainage area	= 0.110 ac	Runoff coeff.	= 0.9
Intensity	= 6.773 in/hr	Tc by User	= 5.00 min
IDF Curve	= OKC, OK IDF.IDF	Asc/Rec limb fact	= 1/1

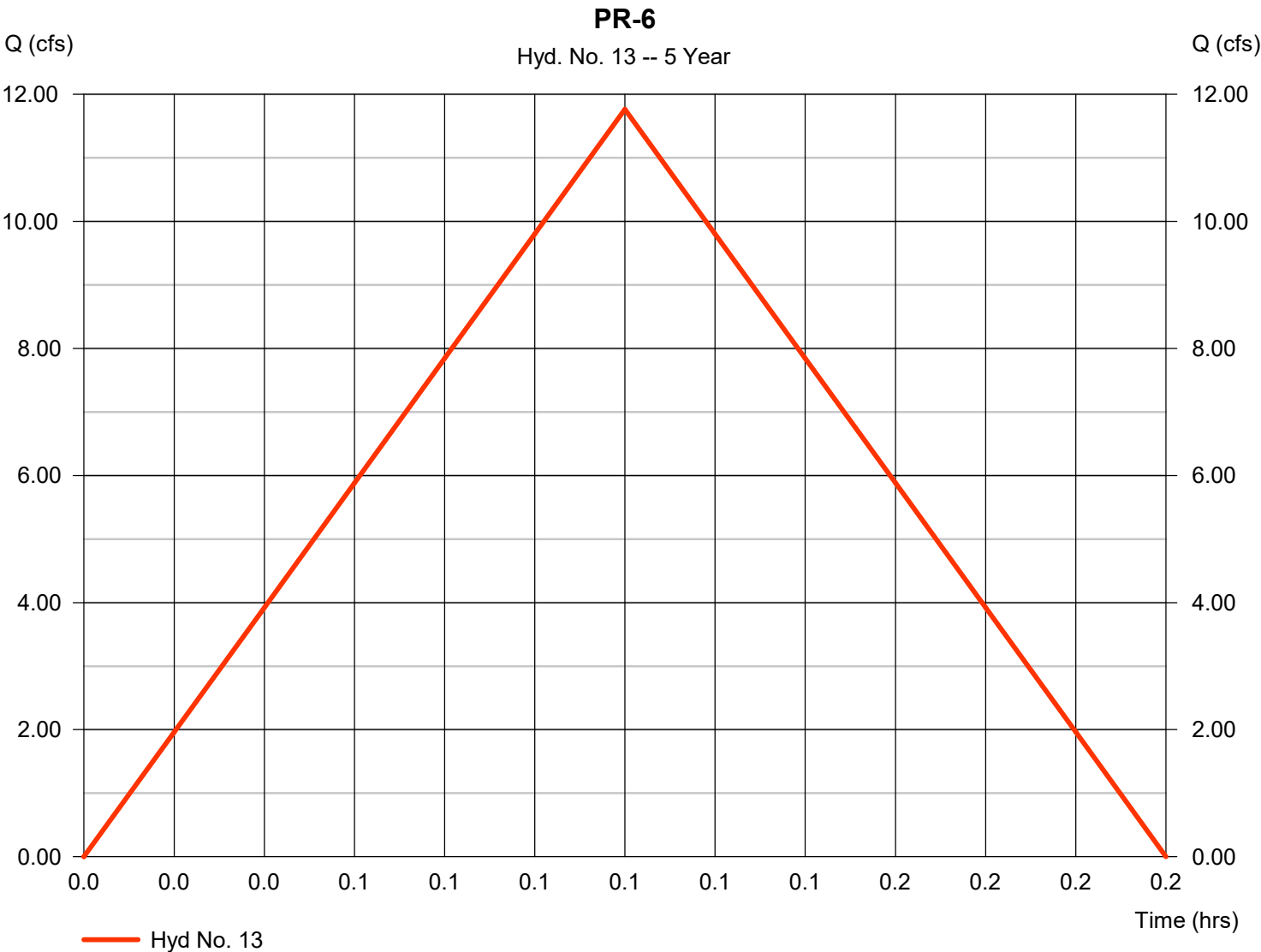


Hydrograph Report

Hyd. No. 13

PR-6

Hydrograph type	= Rational	Peak discharge	= 11.77 cfs
Storm frequency	= 5 yrs	Time to peak	= 0.10 hrs
Time interval	= 1 min	Hyd. volume	= 4,236 cuft
Drainage area	= 2.010 ac	Runoff coeff.	= 0.9
Intensity	= 6.504 in/hr	Tc by User	= 6.00 min
IDF Curve	= OKC, OK IDF.IDF	Asc/Rec limb fact	= 1/1

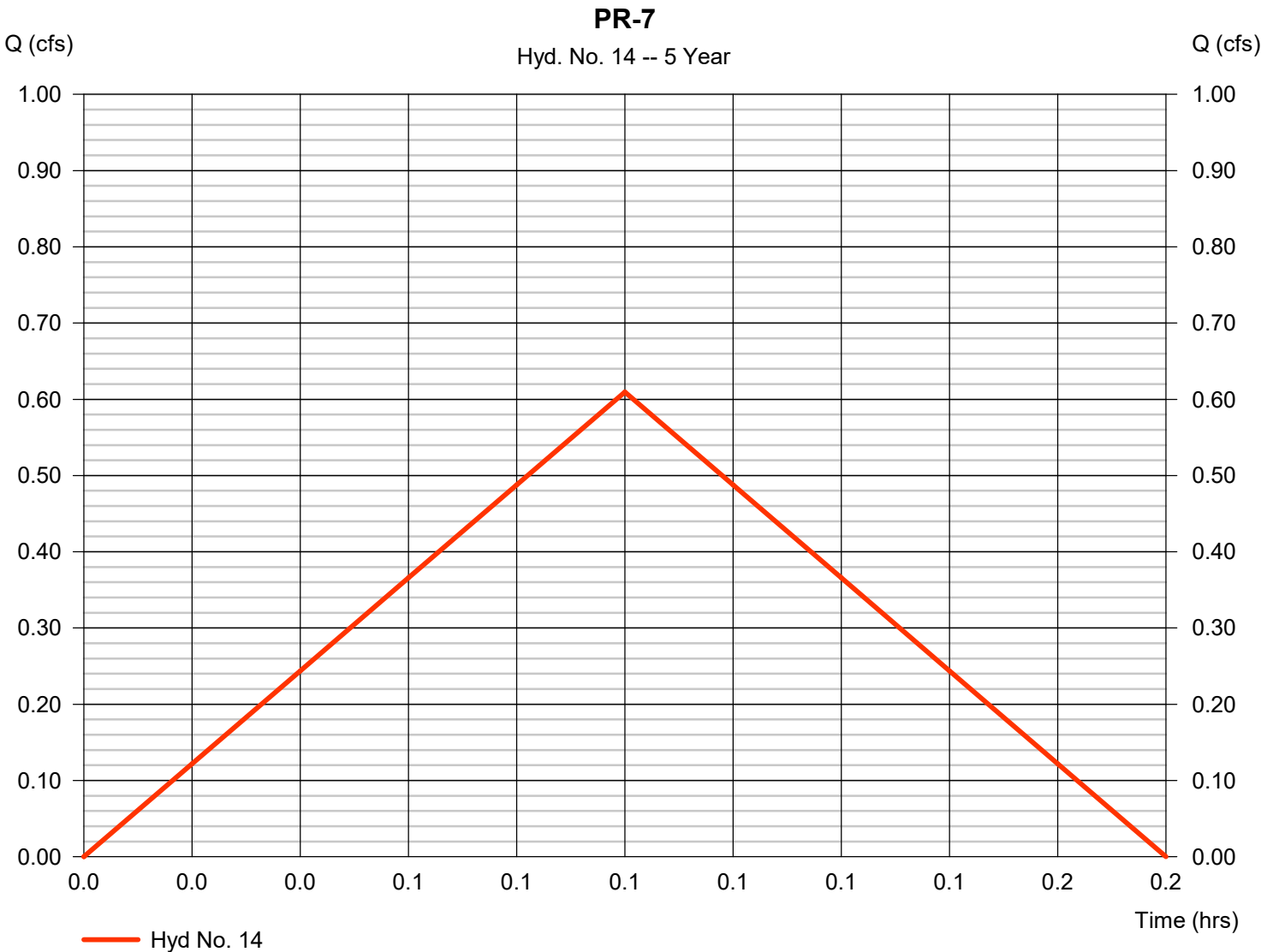


Hydrograph Report

Hyd. No. 14

PR-7

Hydrograph type	= Rational	Peak discharge	= 0.610 cfs
Storm frequency	= 5 yrs	Time to peak	= 0.08 hrs
Time interval	= 1 min	Hyd. volume	= 183 cuft
Drainage area	= 0.100 ac	Runoff coeff.	= 0.9
Intensity	= 6.773 in/hr	Tc by User	= 5.00 min
IDF Curve	= OKC, OK IDF.IDF	Asc/Rec limb fact	= 1/1

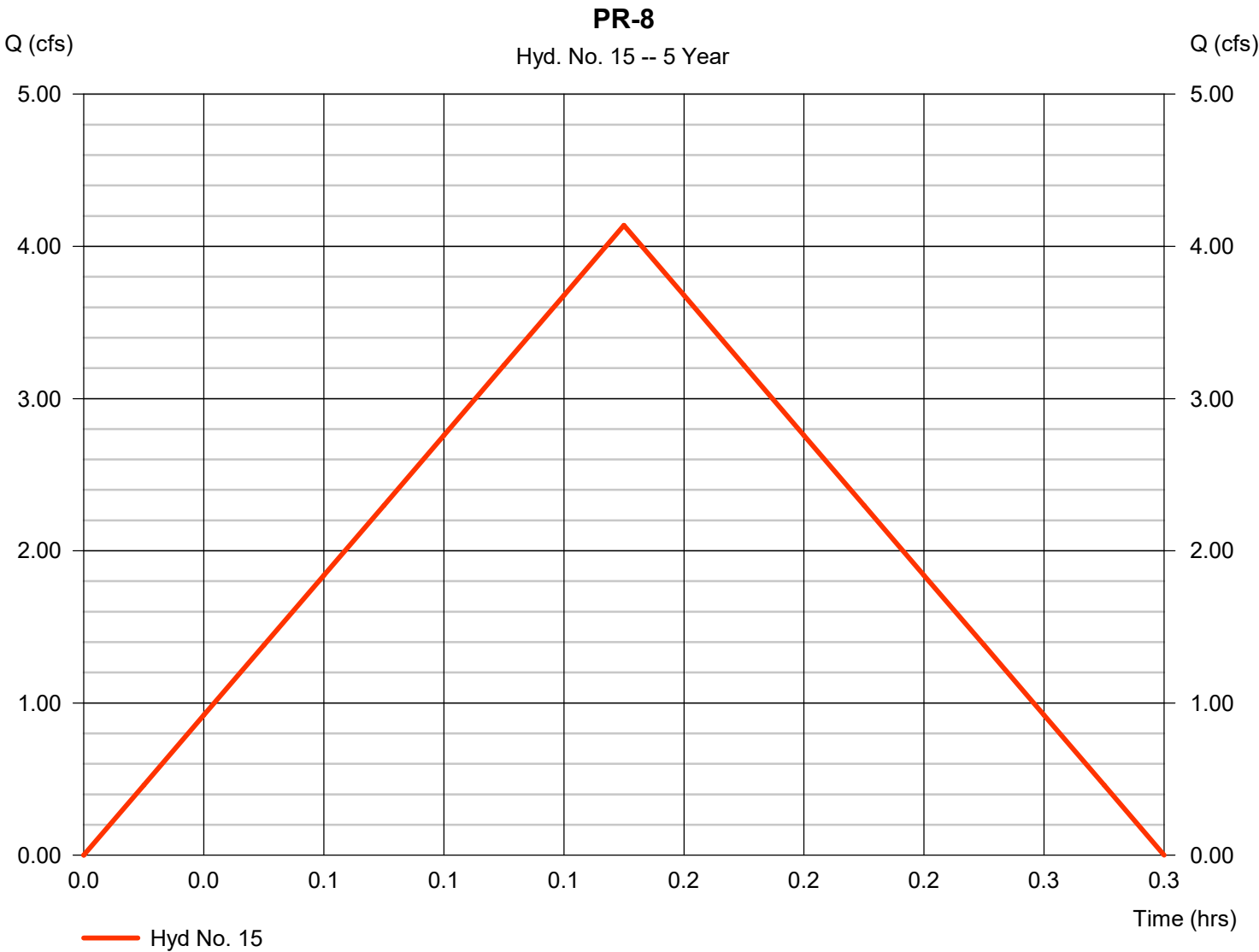


Hydrograph Report

Hyd. No. 15

PR-8

Hydrograph type	= Rational	Peak discharge	= 4.138 cfs
Storm frequency	= 5 yrs	Time to peak	= 0.15 hrs
Time interval	= 1 min	Hyd. volume	= 2,235 cuft
Drainage area	= 0.790 ac	Runoff coeff.	= 0.9
Intensity	= 5.820 in/hr	Tc by User	= 9.00 min
IDF Curve	= OKC, OK IDF.IDF	Asc/Rec limb fact	= 1/1

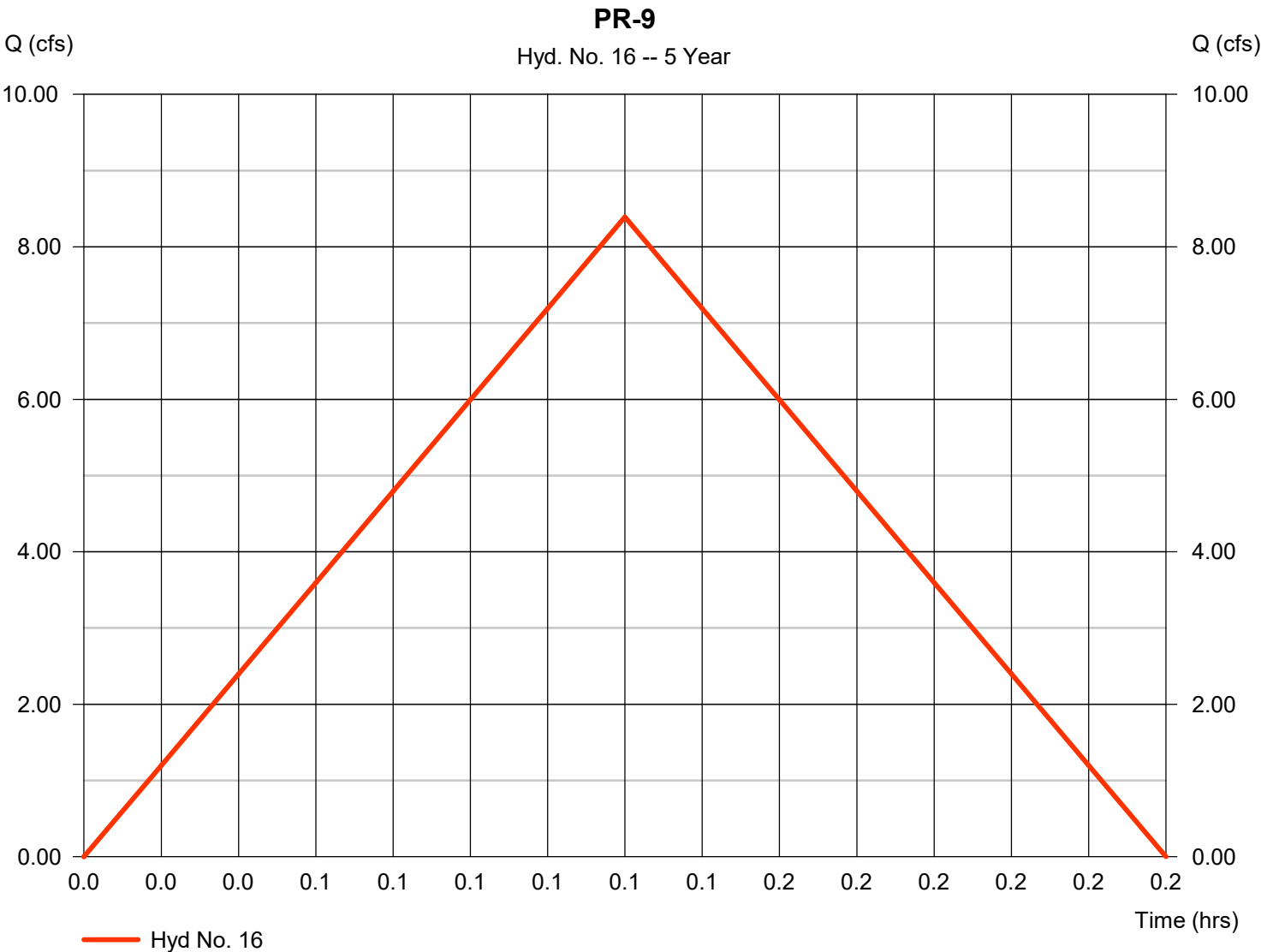


Hydrograph Report

Hyd. No. 16

PR-9

Hydrograph type	= Rational	Peak discharge	= 8.391 cfs
Storm frequency	= 5 yrs	Time to peak	= 0.12 hrs
Time interval	= 1 min	Hyd. volume	= 3,524 cuft
Drainage area	= 1.490 ac	Runoff coeff.	= 0.9
Intensity	= 6.257 in/hr	Tc by User	= 7.00 min
IDF Curve	= OKC, OK IDF.IDF	Asc/Rec limb fact	= 1/1



Hydrograph Summary Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2022

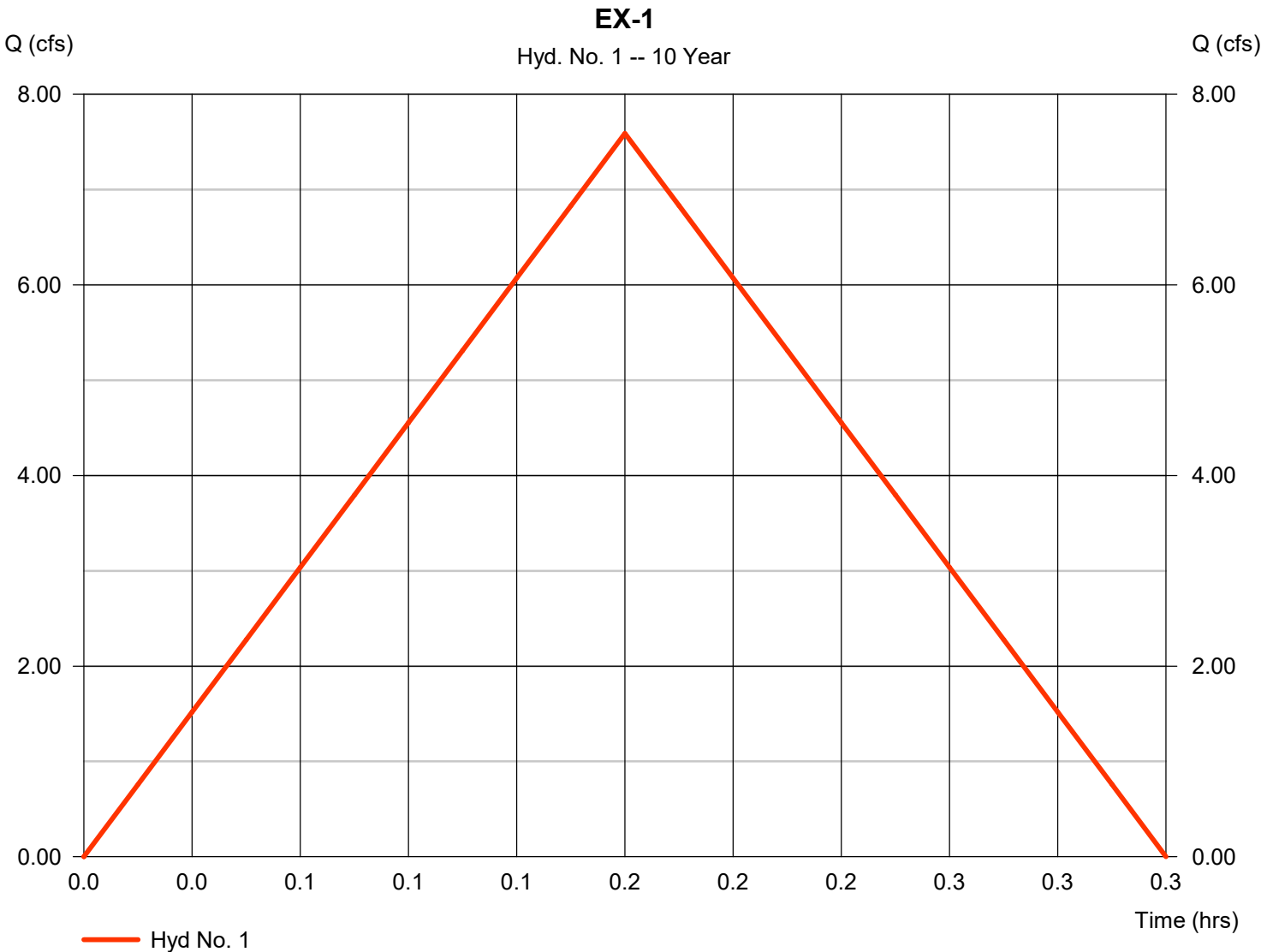
Hyd. No.	Hydrograph type (origin)	Peak flow (cfs)	Time interval (min)	Time to Peak (min)	Hyd. volume (cuft)	Inflow hyd(s)	Maximum elevation (ft)	Total strge used (cuft)	Hydrograph Description
1	Rational	7.592	1	10	4,555	-----	-----	-----	EX-1
2	Rational	17.65	1	8	8,471	-----	-----	-----	EX-2
3	Rational	7.142	1	10	4,285	-----	-----	-----	EX-3
4	Rational	14.29	1	7	6,003	-----	-----	-----	EX-4
5	Rational	0.736	1	5	221	-----	-----	-----	EX-5
6	Rational	12.95	1	6	4,663	-----	-----	-----	EX-6
7	Rational	0.669	1	5	201	-----	-----	-----	EX-7
8	Rational	7.592	1	10	4,555	-----	-----	-----	PR-1
9	Rational	17.65	1	8	8,471	-----	-----	-----	PR-2
10	Rational	3.093	1	6	1,114	-----	-----	-----	PR-3
11	Rational	5.421	1	5	1,626	-----	-----	-----	PR-4
12	Rational	0.736	1	5	221	-----	-----	-----	PR-5
13	Rational	12.95	1	6	4,663	-----	-----	-----	PR-6
14	Rational	0.669	1	5	201	-----	-----	-----	PR-7
15	Rational	4.587	1	9	2,477	-----	-----	-----	PR-8
16	Rational	9.260	1	7	3,889	-----	-----	-----	PR-9
Flows.gpw					Return Period: 10 Year			Friday, 02 / 11 / 2022	

Hydrograph Report

Hyd. No. 1

EX-1

Hydrograph type	= Rational	Peak discharge	= 7.592 cfs
Storm frequency	= 10 yrs	Time to peak	= 0.17 hrs
Time interval	= 1 min	Hyd. volume	= 4,555 cuft
Drainage area	= 1.350 ac	Runoff coeff.	= 0.9
Intensity	= 6.248 in/hr	Tc by User	= 10.00 min
IDF Curve	= OKC, OK IDF.IDF	Asc/Rec limb fact	= 1/1

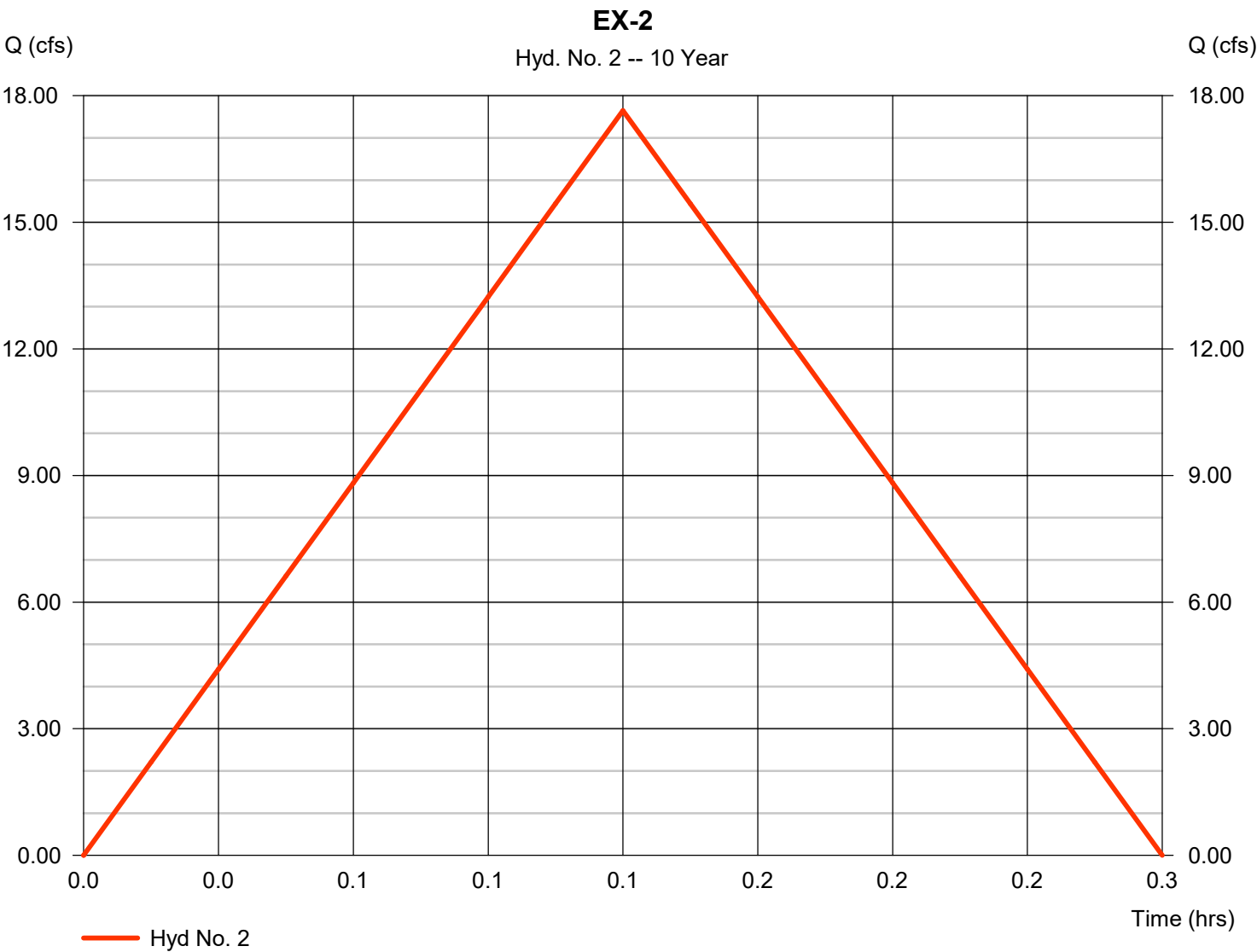


Hydrograph Report

Hyd. No. 2

EX-2

Hydrograph type	= Rational	Peak discharge	= 17.65 cfs
Storm frequency	= 10 yrs	Time to peak	= 0.13 hrs
Time interval	= 1 min	Hyd. volume	= 8,471 cuft
Drainage area	= 2.940 ac	Runoff coeff.	= 0.9
Intensity	= 6.669 in/hr	Tc by User	= 8.00 min
IDF Curve	= OKC, OK IDF.IDF	Asc/Rec limb fact	= 1/1

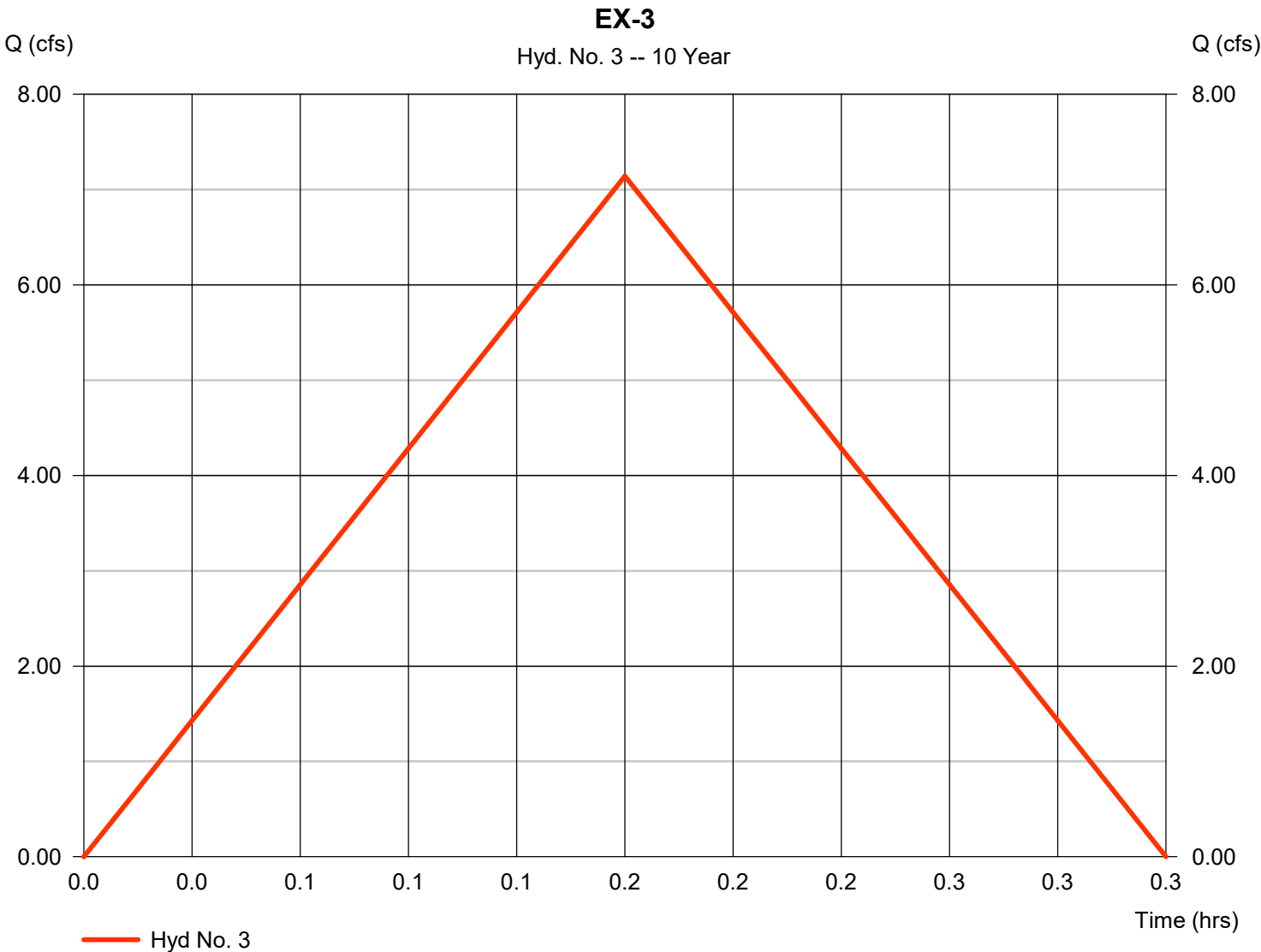


Hydrograph Report

Hyd. No. 3

EX-3

Hydrograph type	= Rational	Peak discharge	= 7.142 cfs
Storm frequency	= 10 yrs	Time to peak	= 0.17 hrs
Time interval	= 1 min	Hyd. volume	= 4,285 cuft
Drainage area	= 1.270 ac	Runoff coeff.	= 0.9
Intensity	= 6.248 in/hr	Tc by User	= 10.00 min
IDF Curve	= OKC, OK IDF.IDF	Asc/Rec limb fact	= 1/1

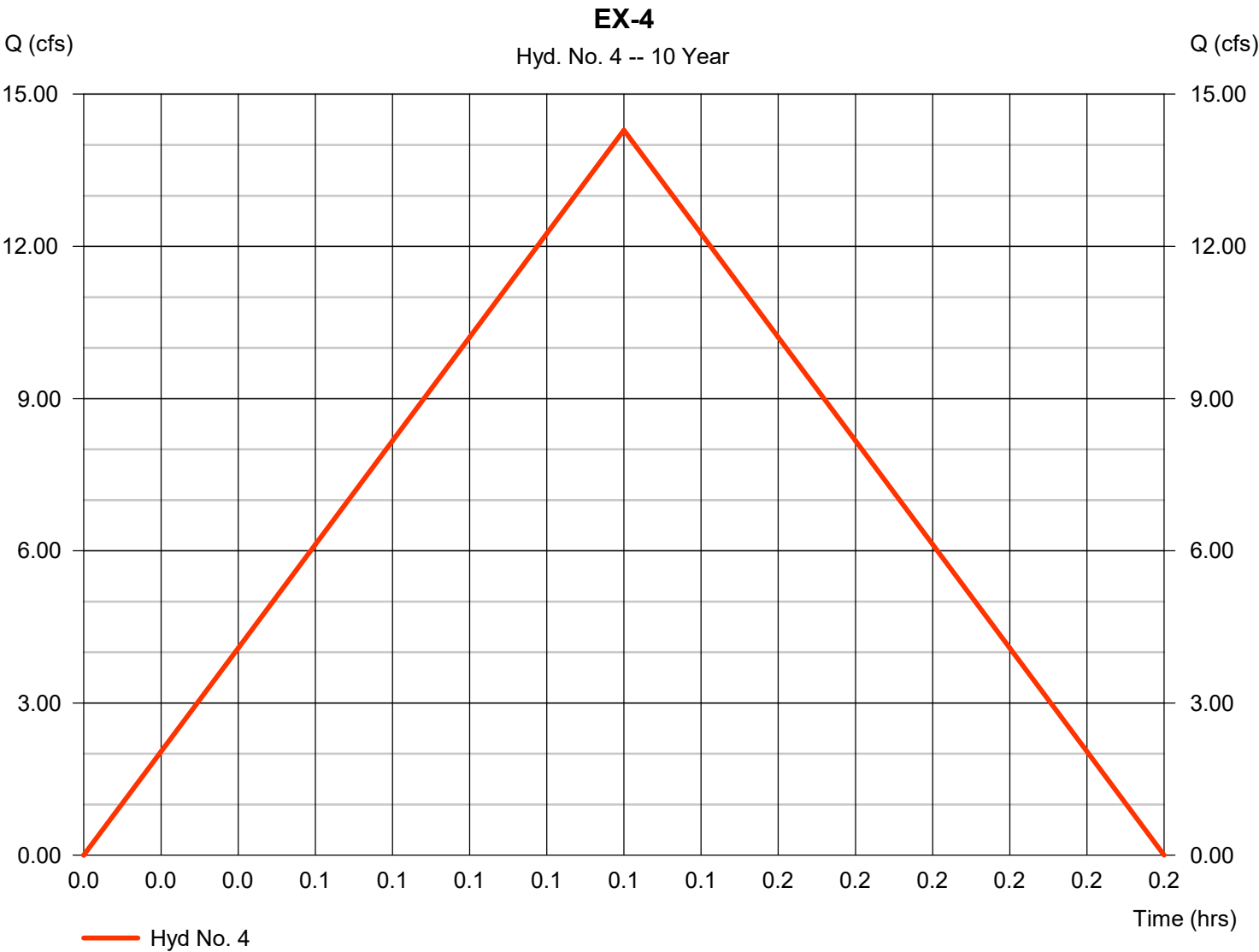


Hydrograph Report

Hyd. No. 4

EX-4

Hydrograph type	= Rational	Peak discharge	= 14.29 cfs
Storm frequency	= 10 yrs	Time to peak	= 0.12 hrs
Time interval	= 1 min	Hyd. volume	= 6,003 cuft
Drainage area	= 2.300 ac	Runoff coeff.	= 0.9
Intensity	= 6.905 in/hr	Tc by User	= 7.00 min
IDF Curve	= OKC, OK IDF.IDF	Asc/Rec limb fact	= 1/1

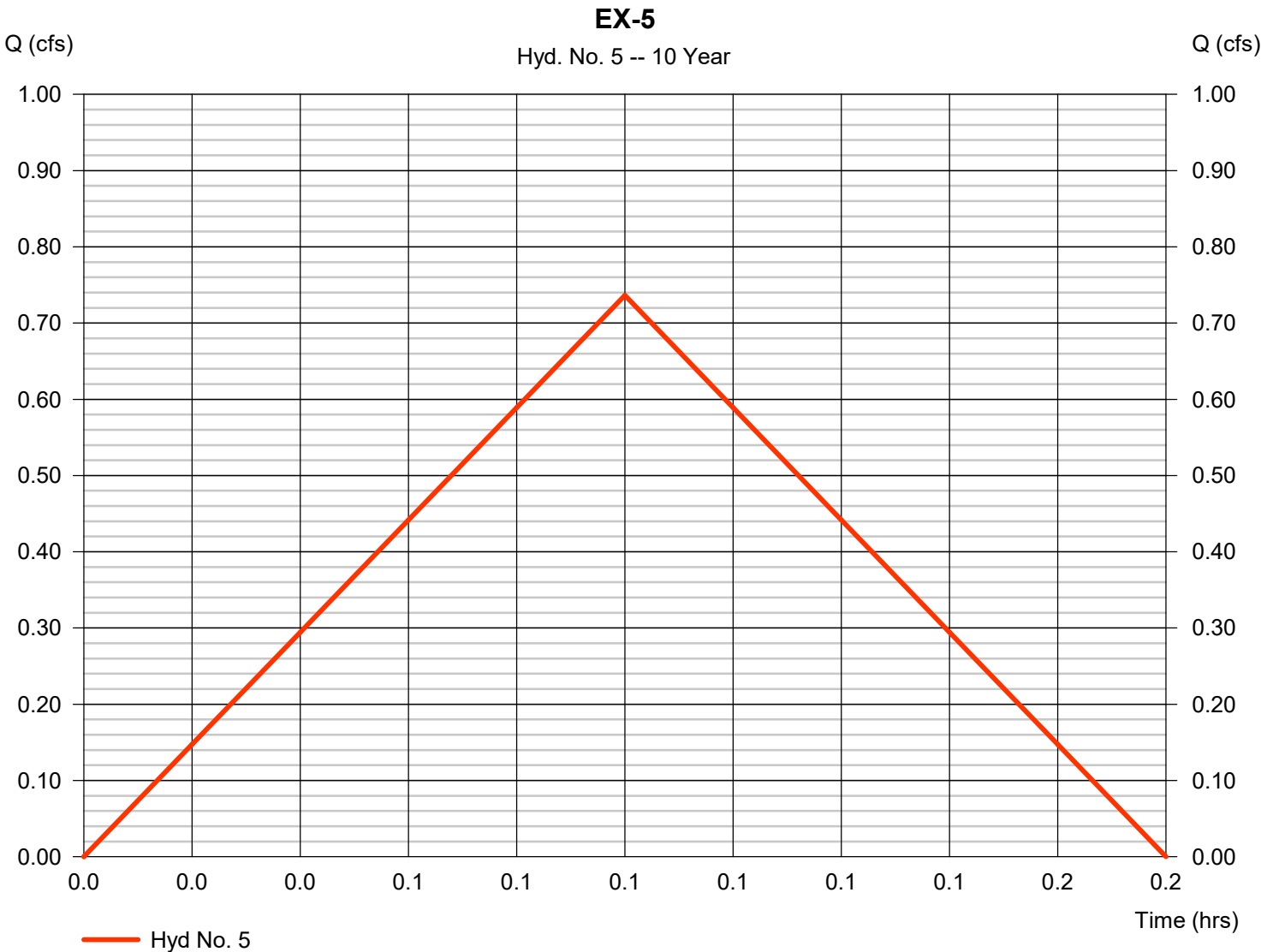


Hydrograph Report

Hyd. No. 5

EX-5

Hydrograph type	= Rational	Peak discharge	= 0.736 cfs
Storm frequency	= 10 yrs	Time to peak	= 0.08 hrs
Time interval	= 1 min	Hyd. volume	= 221 cuft
Drainage area	= 0.110 ac	Runoff coeff.	= 0.9
Intensity	= 7.437 in/hr	Tc by User	= 5.00 min
IDF Curve	= OKC, OK IDF.IDF	Asc/Rec limb fact	= 1/1

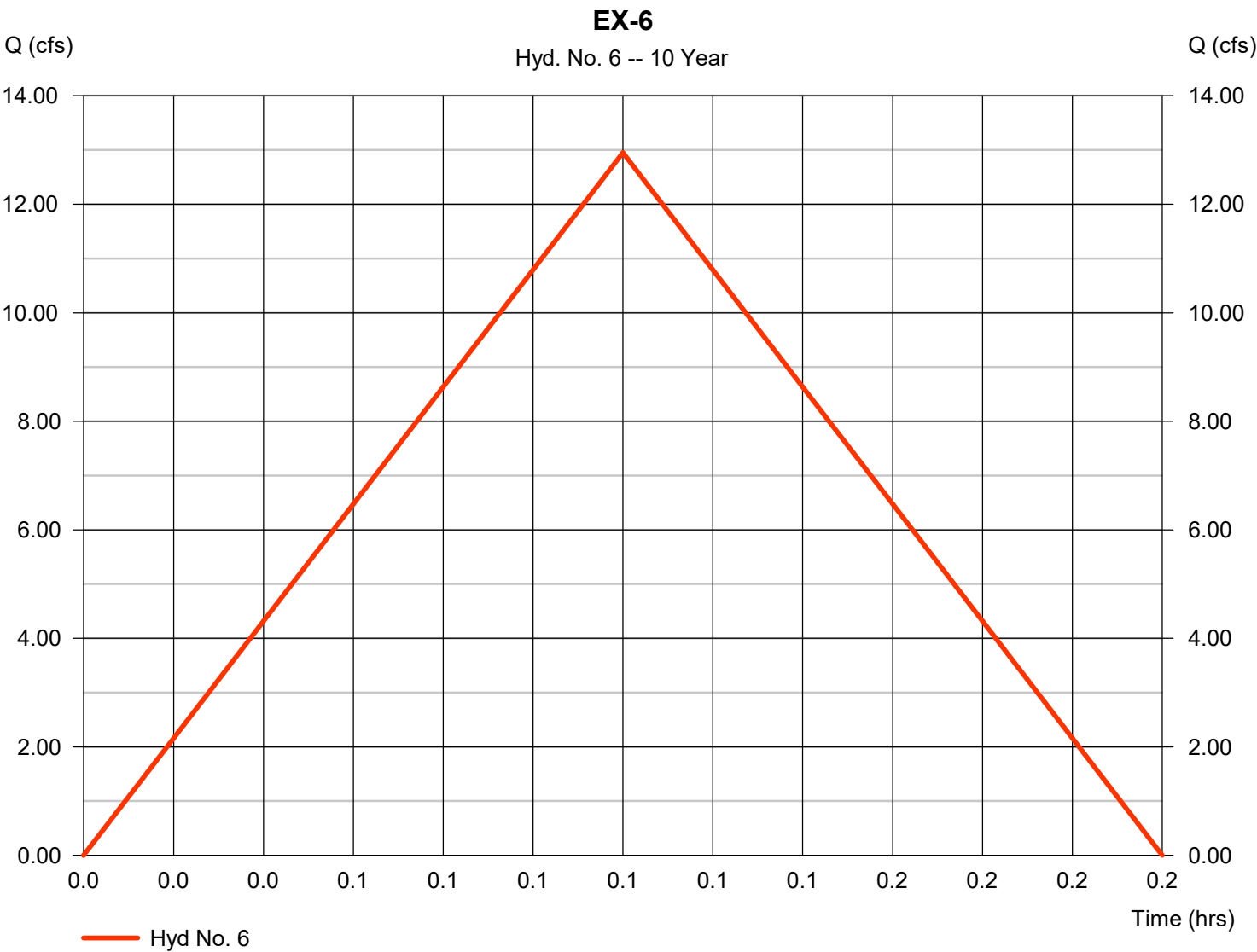


Hydrograph Report

Hyd. No. 6

EX-6

Hydrograph type	= Rational	Peak discharge	= 12.95 cfs
Storm frequency	= 10 yrs	Time to peak	= 0.10 hrs
Time interval	= 1 min	Hyd. volume	= 4,663 cuft
Drainage area	= 2.010 ac	Runoff coeff.	= 0.9
Intensity	= 7.160 in/hr	Tc by User	= 6.00 min
IDF Curve	= OKC, OK IDF.IDF	Asc/Rec limb fact	= 1/1

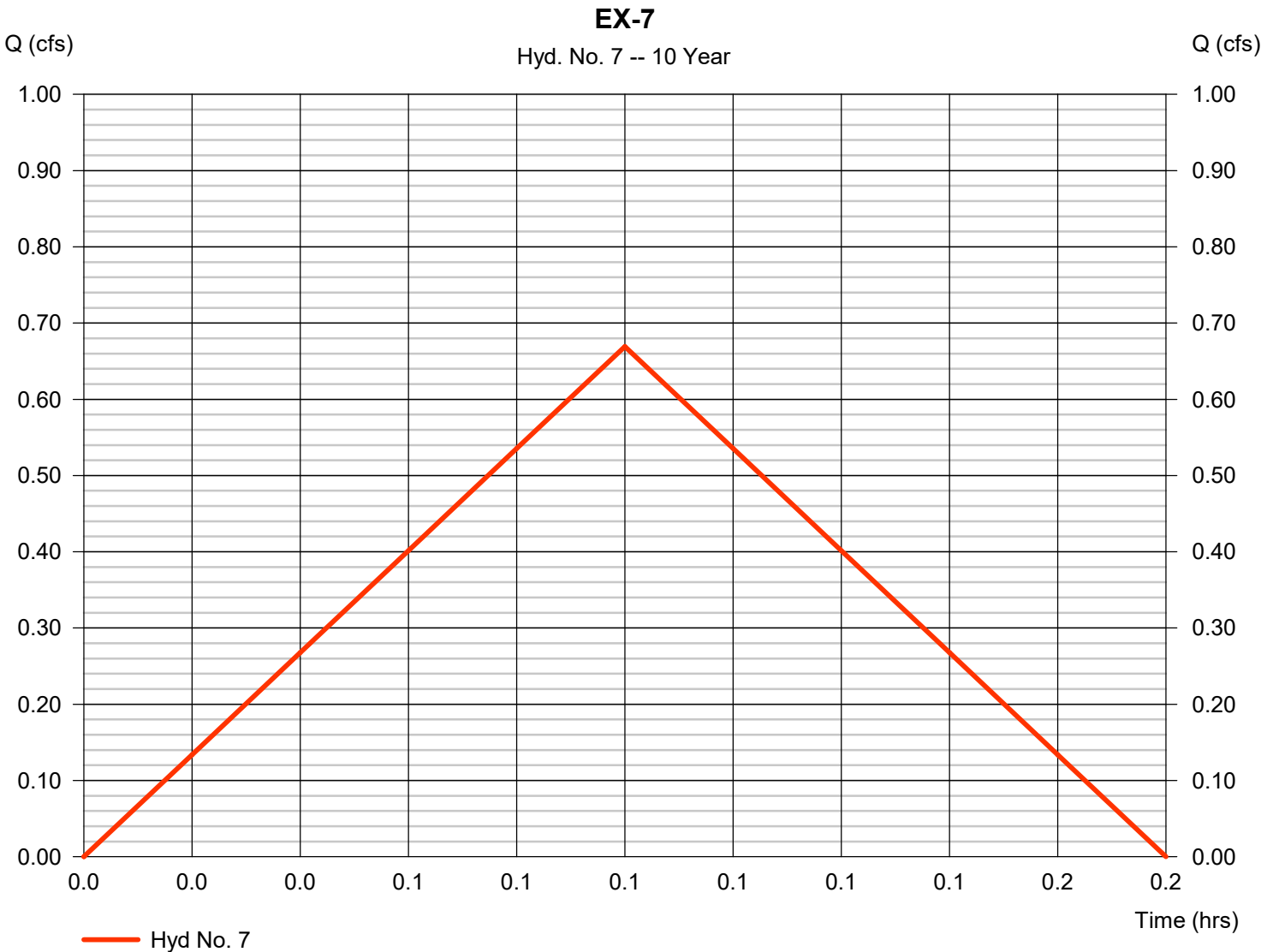


Hydrograph Report

Hyd. No. 7

EX-7

Hydrograph type	= Rational	Peak discharge	= 0.669 cfs
Storm frequency	= 10 yrs	Time to peak	= 0.08 hrs
Time interval	= 1 min	Hyd. volume	= 201 cuft
Drainage area	= 0.100 ac	Runoff coeff.	= 0.9
Intensity	= 7.437 in/hr	Tc by User	= 5.00 min
IDF Curve	= OKC, OK IDF.IDF	Asc/Rec limb fact	= 1/1

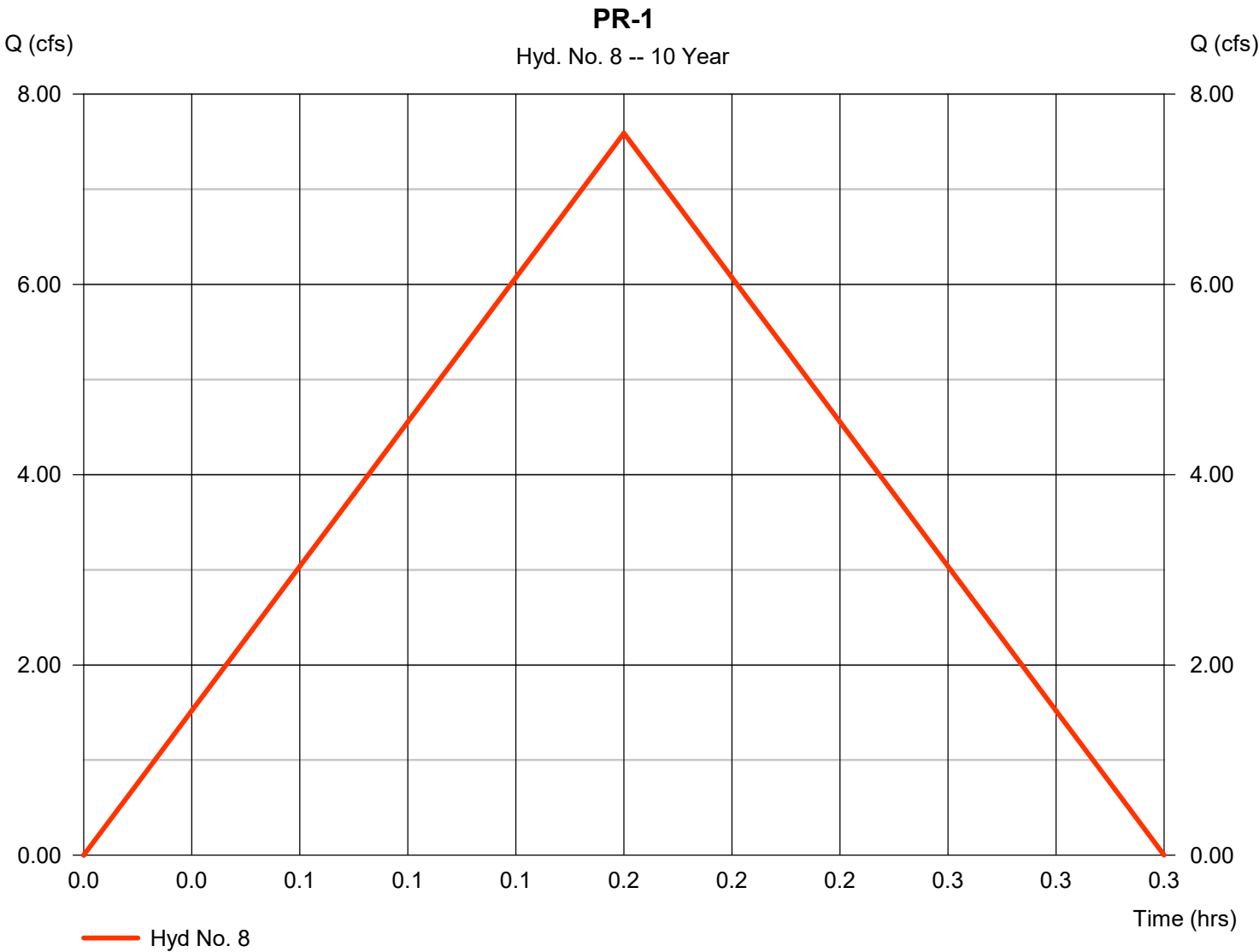


Hydrograph Report

Hyd. No. 8

PR-1

Hydrograph type	= Rational	Peak discharge	= 7.592 cfs
Storm frequency	= 10 yrs	Time to peak	= 0.17 hrs
Time interval	= 1 min	Hyd. volume	= 4,555 cuft
Drainage area	= 1.350 ac	Runoff coeff.	= 0.9
Intensity	= 6.248 in/hr	Tc by User	= 10.00 min
IDF Curve	= OKC, OK IDF.IDF	Asc/Rec limb fact	= 1/1

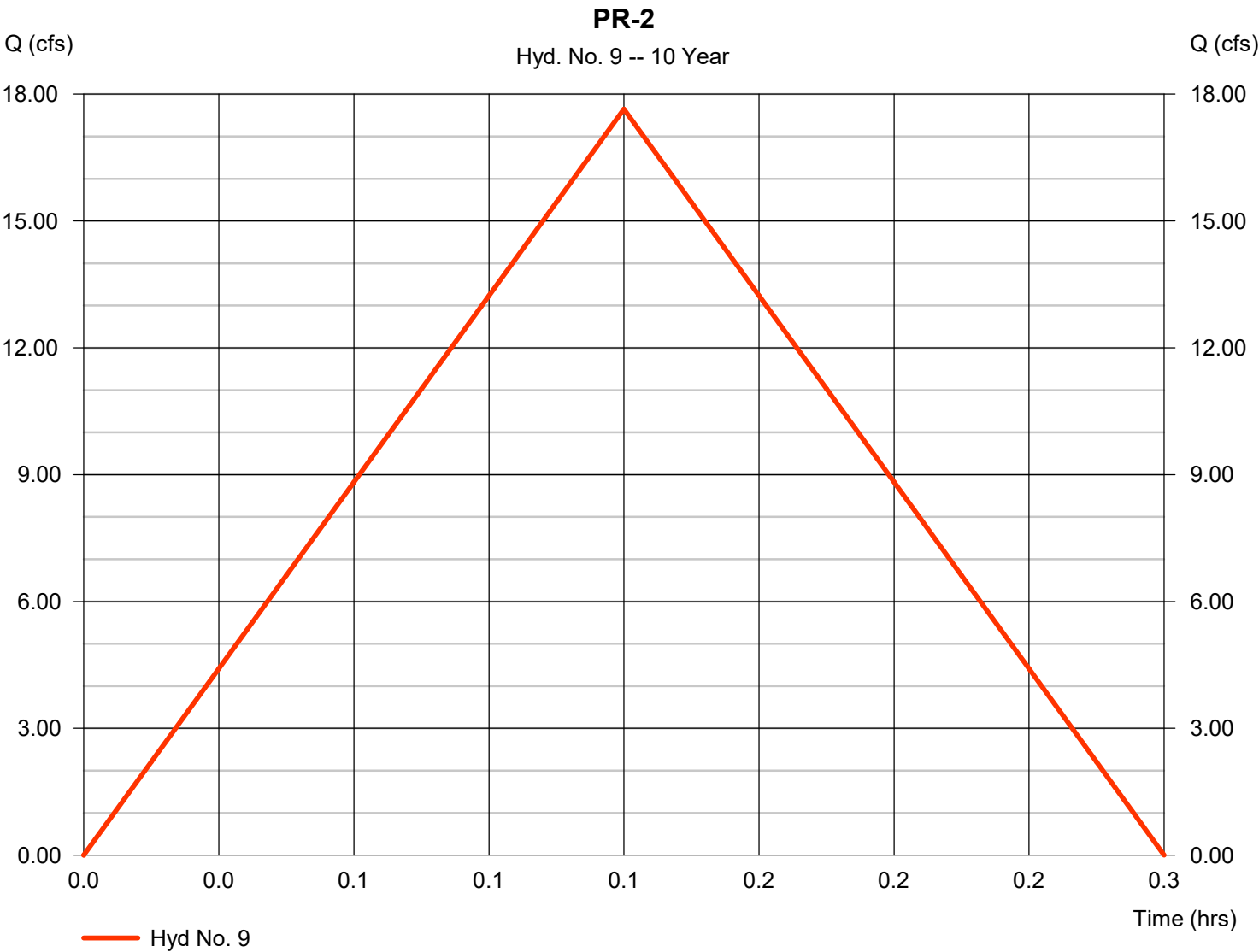


Hydrograph Report

Hyd. No. 9

PR-2

Hydrograph type	= Rational	Peak discharge	= 17.65 cfs
Storm frequency	= 10 yrs	Time to peak	= 0.13 hrs
Time interval	= 1 min	Hyd. volume	= 8,471 cuft
Drainage area	= 2.940 ac	Runoff coeff.	= 0.9
Intensity	= 6.669 in/hr	Tc by User	= 8.00 min
IDF Curve	= OKC, OK IDF.IDF	Asc/Rec limb fact	= 1/1

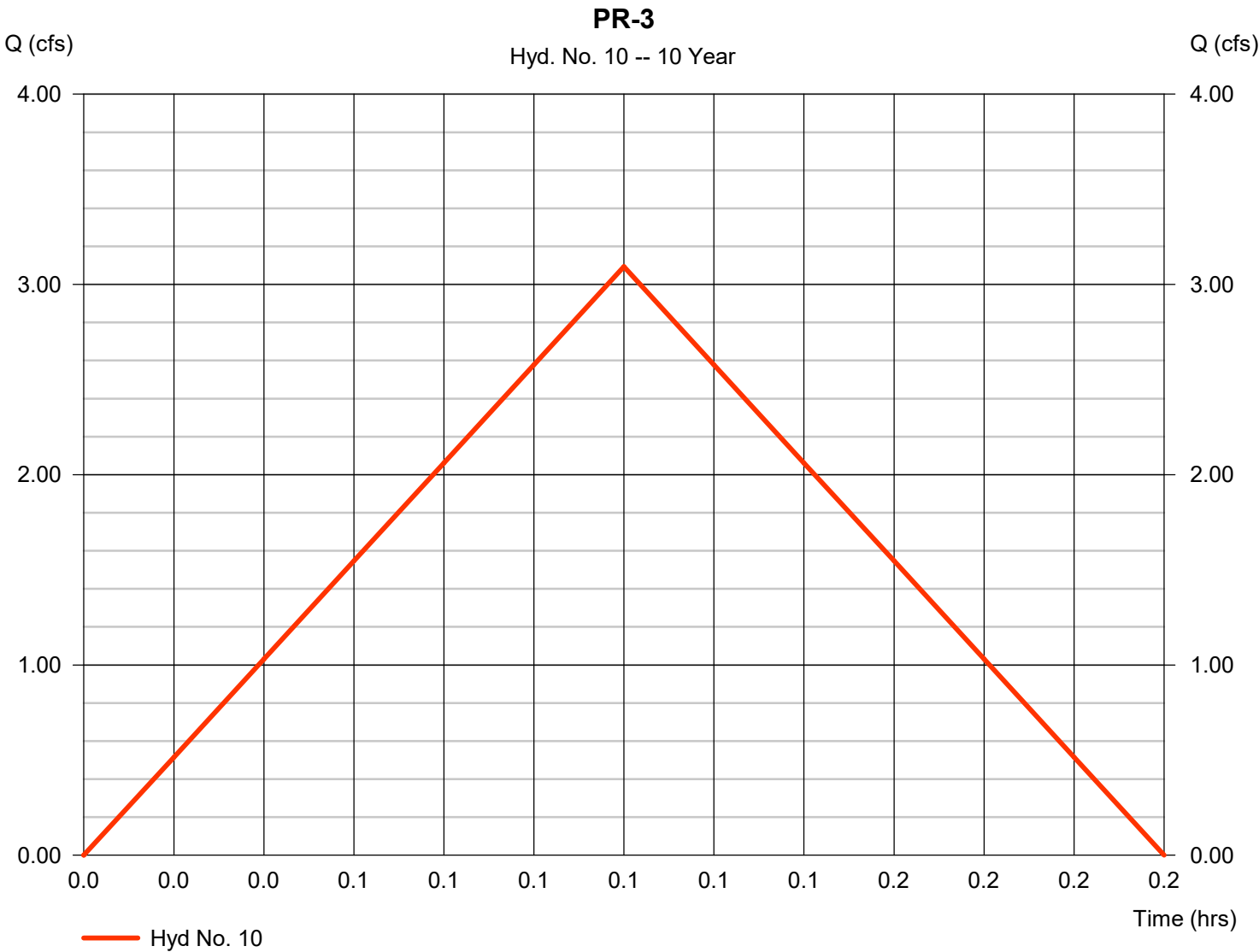


Hydrograph Report

Hyd. No. 10

PR-3

Hydrograph type	= Rational	Peak discharge	= 3.093 cfs
Storm frequency	= 10 yrs	Time to peak	= 0.10 hrs
Time interval	= 1 min	Hyd. volume	= 1,114 cuft
Drainage area	= 0.480 ac	Runoff coeff.	= 0.9
Intensity	= 7.160 in/hr	Tc by User	= 6.00 min
IDF Curve	= OKC, OK IDF.IDF	Asc/Rec limb fact	= 1/1

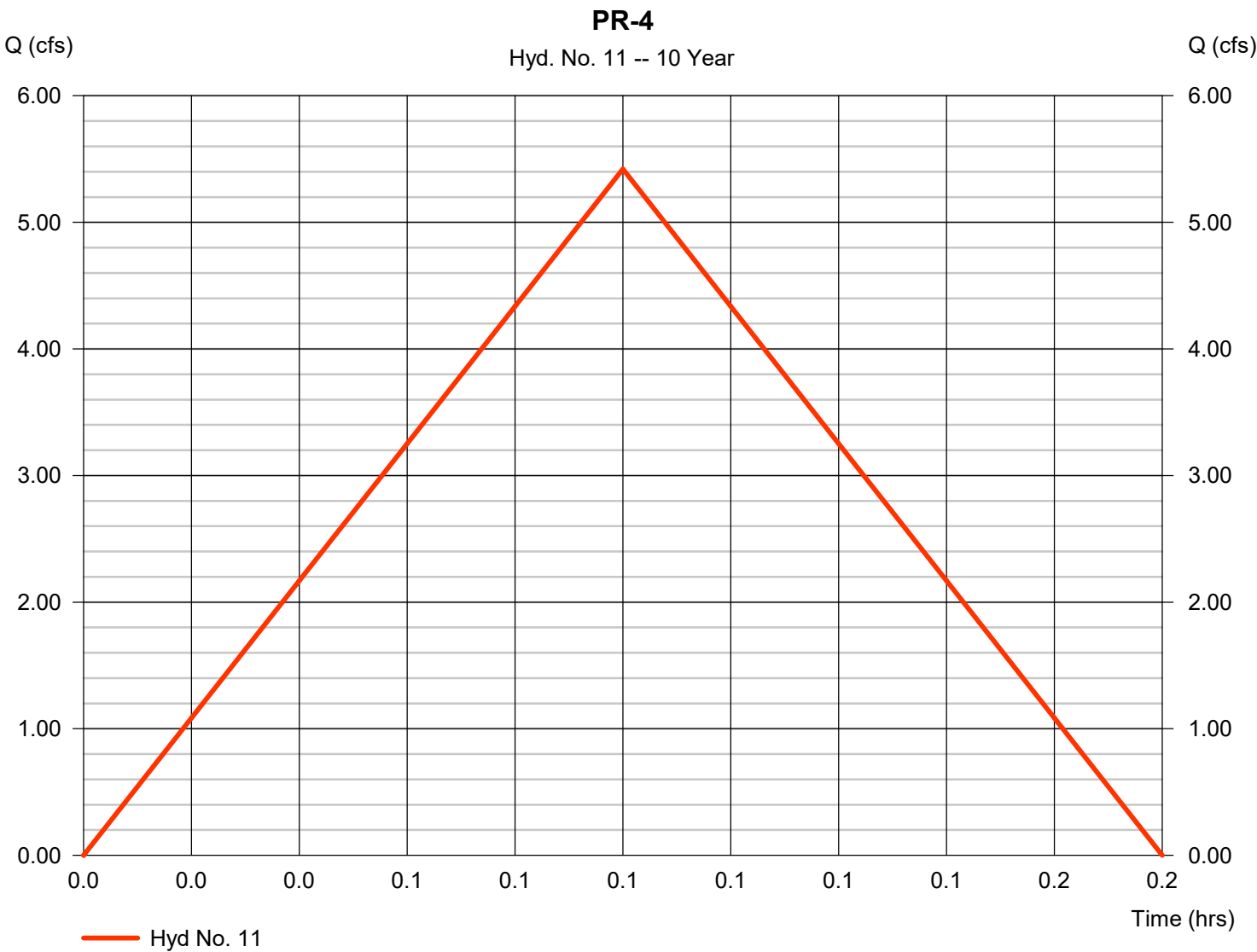


Hydrograph Report

Hyd. No. 11

PR-4

Hydrograph type	= Rational	Peak discharge	= 5.421 cfs
Storm frequency	= 10 yrs	Time to peak	= 0.08 hrs
Time interval	= 1 min	Hyd. volume	= 1,626 cuft
Drainage area	= 0.810 ac	Runoff coeff.	= 0.9
Intensity	= 7.437 in/hr	Tc by User	= 5.00 min
IDF Curve	= OKC, OK IDF.IDF	Asc/Rec limb fact	= 1/1

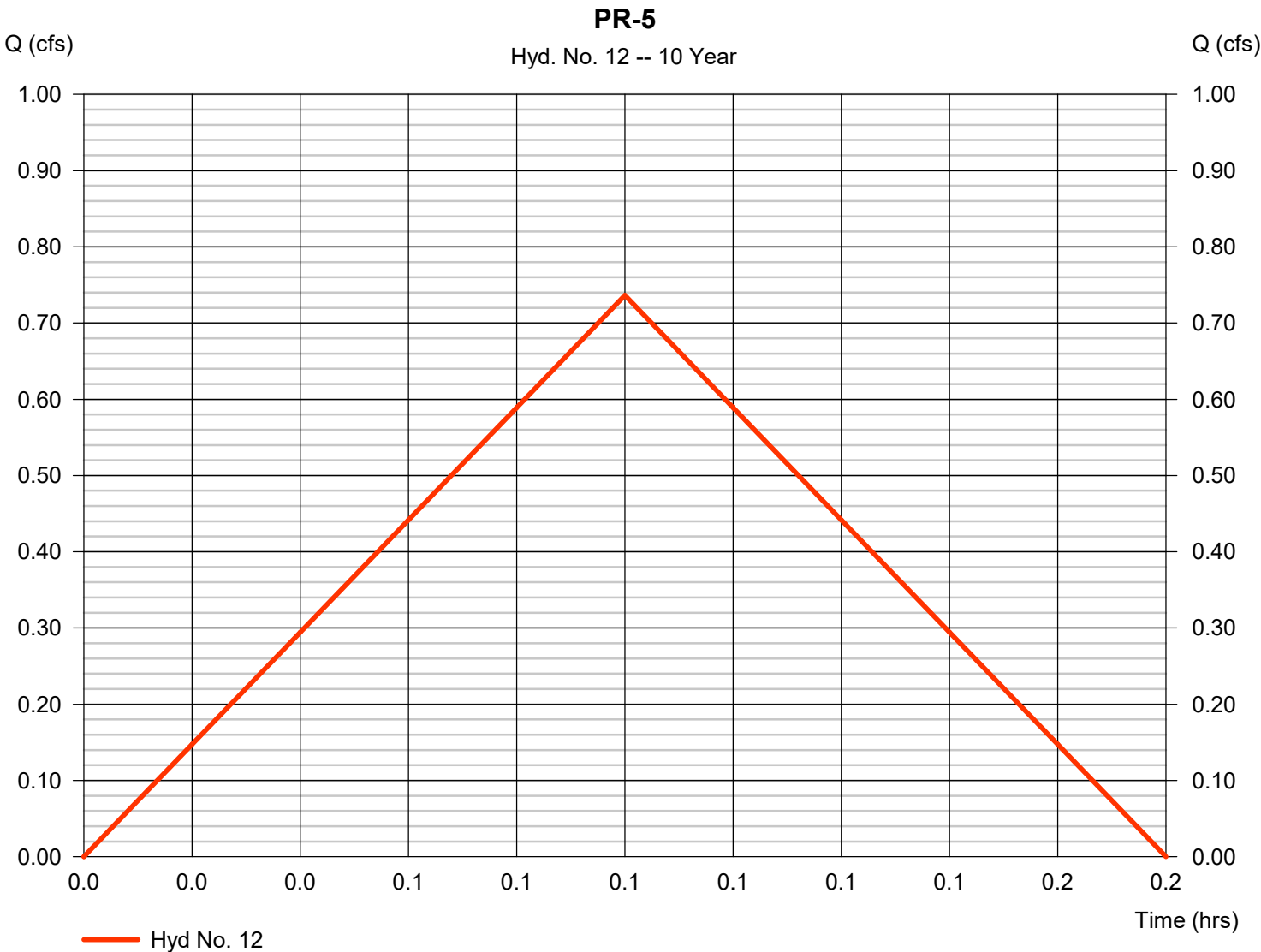


Hydrograph Report

Hyd. No. 12

PR-5

Hydrograph type	= Rational	Peak discharge	= 0.736 cfs
Storm frequency	= 10 yrs	Time to peak	= 0.08 hrs
Time interval	= 1 min	Hyd. volume	= 221 cuft
Drainage area	= 0.110 ac	Runoff coeff.	= 0.9
Intensity	= 7.437 in/hr	Tc by User	= 5.00 min
IDF Curve	= OKC, OK IDF.IDF	Asc/Rec limb fact	= 1/1

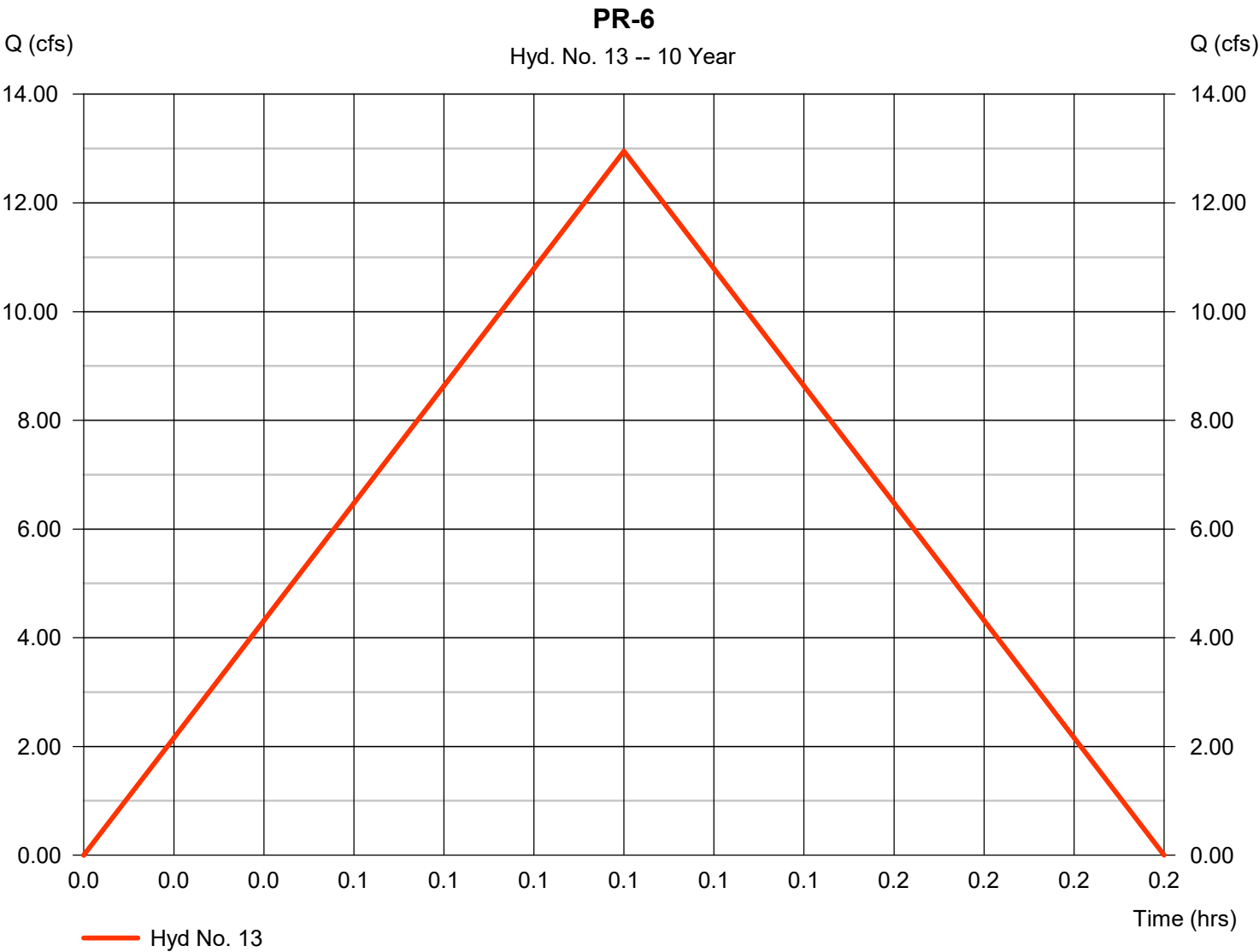


Hydrograph Report

Hyd. No. 13

PR-6

Hydrograph type	= Rational	Peak discharge	= 12.95 cfs
Storm frequency	= 10 yrs	Time to peak	= 0.10 hrs
Time interval	= 1 min	Hyd. volume	= 4,663 cuft
Drainage area	= 2.010 ac	Runoff coeff.	= 0.9
Intensity	= 7.160 in/hr	Tc by User	= 6.00 min
IDF Curve	= OKC, OK IDF.IDF	Asc/Rec limb fact	= 1/1

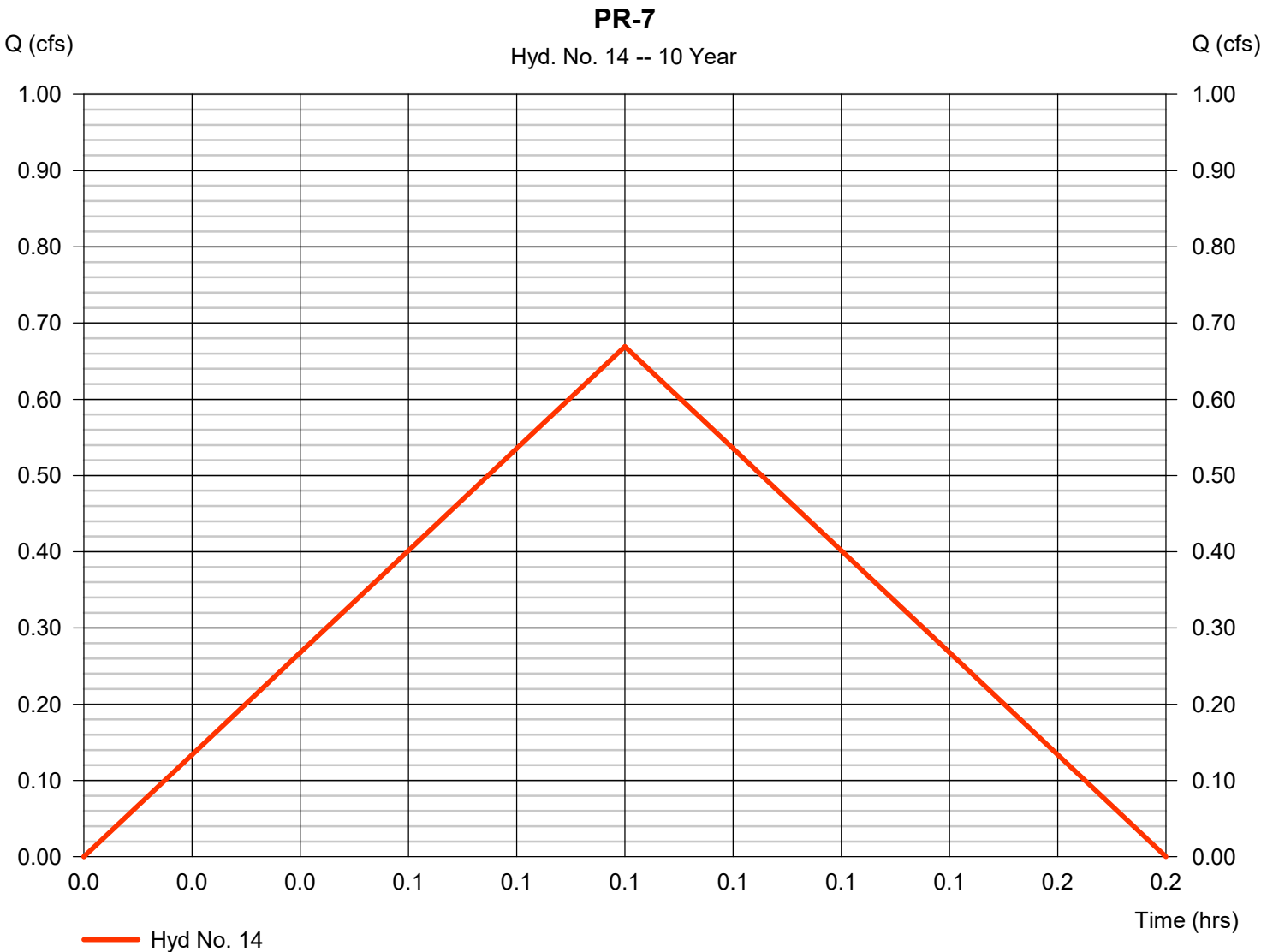


Hydrograph Report

Hyd. No. 14

PR-7

Hydrograph type	= Rational	Peak discharge	= 0.669 cfs
Storm frequency	= 10 yrs	Time to peak	= 0.08 hrs
Time interval	= 1 min	Hyd. volume	= 201 cuft
Drainage area	= 0.100 ac	Runoff coeff.	= 0.9
Intensity	= 7.437 in/hr	Tc by User	= 5.00 min
IDF Curve	= OKC, OK IDF.IDF	Asc/Rec limb fact	= 1/1

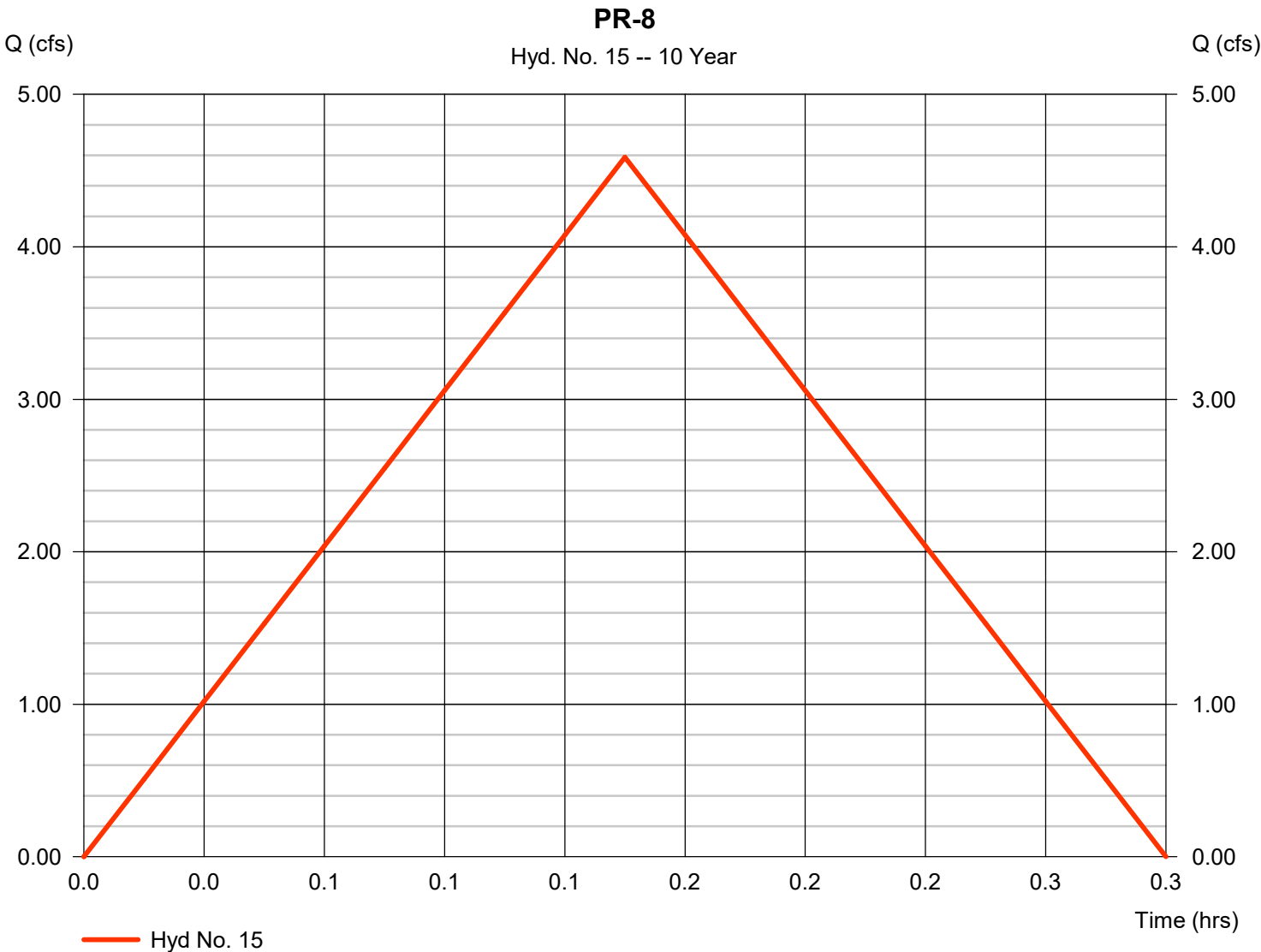


Hydrograph Report

Hyd. No. 15

PR-8

Hydrograph type	= Rational	Peak discharge	= 4.587 cfs
Storm frequency	= 10 yrs	Time to peak	= 0.15 hrs
Time interval	= 1 min	Hyd. volume	= 2,477 cuft
Drainage area	= 0.790 ac	Runoff coeff.	= 0.9
Intensity	= 6.451 in/hr	Tc by User	= 9.00 min
IDF Curve	= OKC, OK IDF.IDF	Asc/Rec limb fact	= 1/1

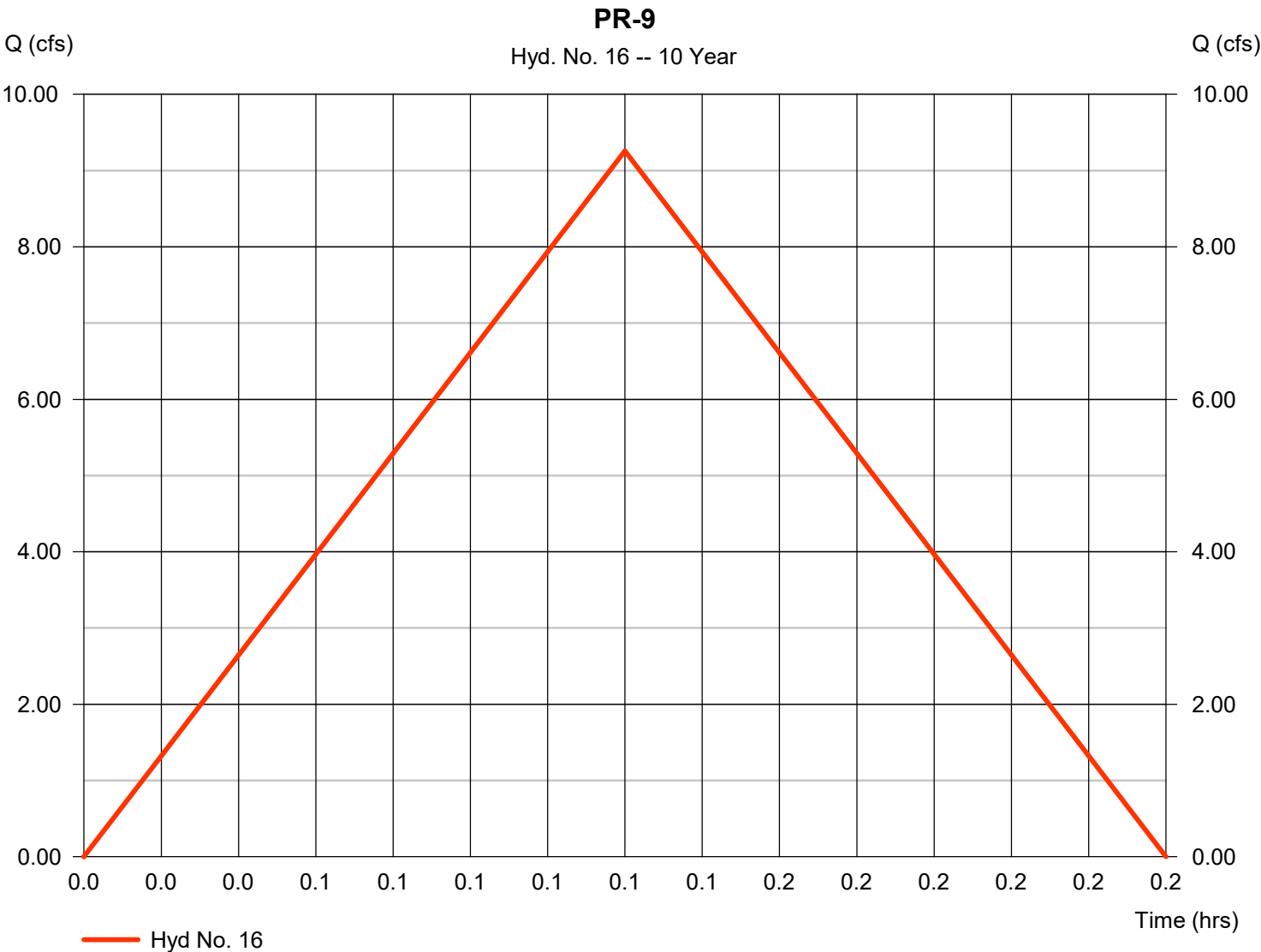


Hydrograph Report

Hyd. No. 16

PR-9

Hydrograph type	= Rational	Peak discharge	= 9.260 cfs
Storm frequency	= 10 yrs	Time to peak	= 0.12 hrs
Time interval	= 1 min	Hyd. volume	= 3,889 cuft
Drainage area	= 1.490 ac	Runoff coeff.	= 0.9
Intensity	= 6.905 in/hr	Tc by User	= 7.00 min
IDF Curve	= OKC, OK IDF.IDF	Asc/Rec limb fact	= 1/1



Hydrograph Summary Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2022

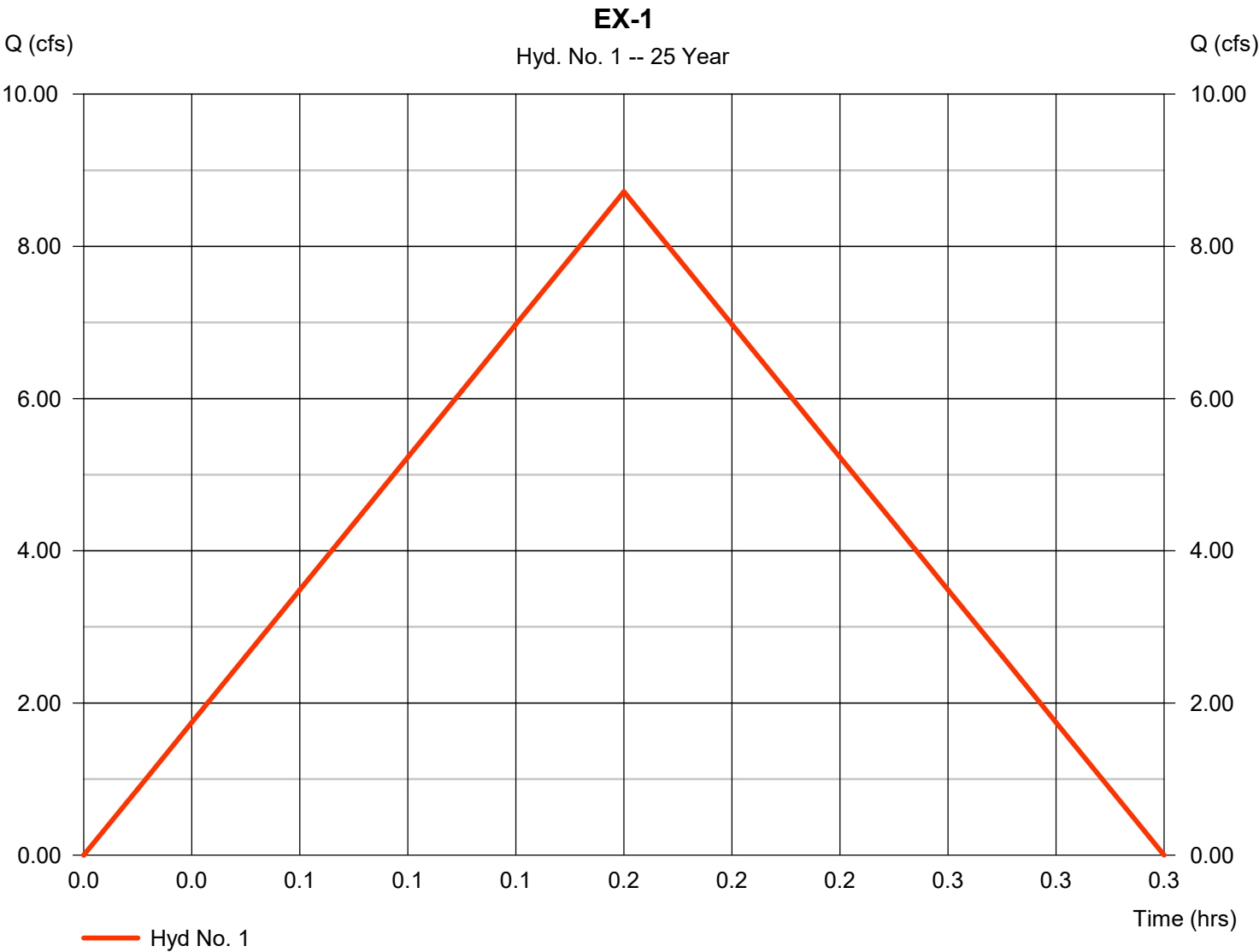
Hyd. No.	Hydrograph type (origin)	Peak flow (cfs)	Time interval (min)	Time to Peak (min)	Hyd. volume (cuft)	Inflow hyd(s)	Maximum elevation (ft)	Total strge used (cuft)	Hydrograph Description
1	Rational	8.718	1	10	5,231	-----	-----	-----	EX-1
2	Rational	20.21	1	8	9,701	-----	-----	-----	EX-2
3	Rational	8.201	1	10	4,921	-----	-----	-----	EX-3
4	Rational	16.35	1	7	6,865	-----	-----	-----	EX-4
5	Rational	0.839	1	5	252	-----	-----	-----	EX-5
6	Rational	14.79	1	6	5,324	-----	-----	-----	EX-6
7	Rational	0.763	1	5	229	-----	-----	-----	EX-7
8	Rational	8.718	1	10	5,231	-----	-----	-----	PR-1
9	Rational	20.21	1	8	9,701	-----	-----	-----	PR-2
10	Rational	3.531	1	6	1,271	-----	-----	-----	PR-3
11	Rational	6.179	1	5	1,854	-----	-----	-----	PR-4
12	Rational	0.839	1	5	252	-----	-----	-----	PR-5
13	Rational	14.79	1	6	5,324	-----	-----	-----	PR-6
14	Rational	0.763	1	5	229	-----	-----	-----	PR-7
15	Rational	5.260	1	9	2,841	-----	-----	-----	PR-8
16	Rational	10.59	1	7	4,447	-----	-----	-----	PR-9
Flows.gpw					Return Period: 25 Year			Friday, 02 / 11 / 2022	

Hydrograph Report

Hyd. No. 1

EX-1

Hydrograph type	= Rational	Peak discharge	= 8.718 cfs
Storm frequency	= 25 yrs	Time to peak	= 0.17 hrs
Time interval	= 1 min	Hyd. volume	= 5,231 cuft
Drainage area	= 1.350 ac	Runoff coeff.	= 0.9
Intensity	= 7.175 in/hr	Tc by User	= 10.00 min
IDF Curve	= OKC, OK IDF.IDF	Asc/Rec limb fact	= 1/1

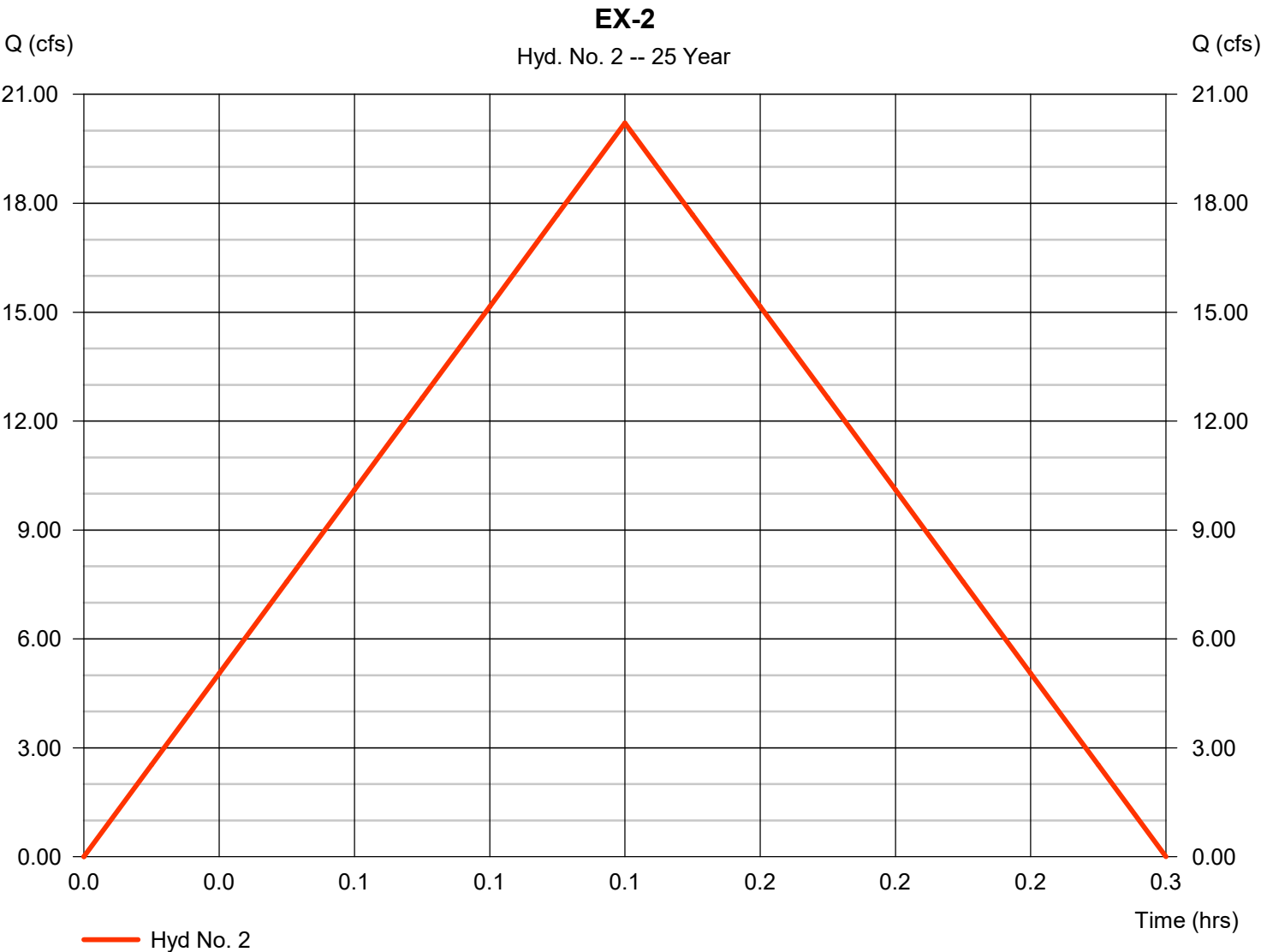


Hydrograph Report

Hyd. No. 2

EX-2

Hydrograph type	= Rational	Peak discharge	= 20.21 cfs
Storm frequency	= 25 yrs	Time to peak	= 0.13 hrs
Time interval	= 1 min	Hyd. volume	= 9,701 cuft
Drainage area	= 2.940 ac	Runoff coeff.	= 0.9
Intensity	= 7.638 in/hr	Tc by User	= 8.00 min
IDF Curve	= OKC, OK IDF.IDF	Asc/Rec limb fact	= 1/1

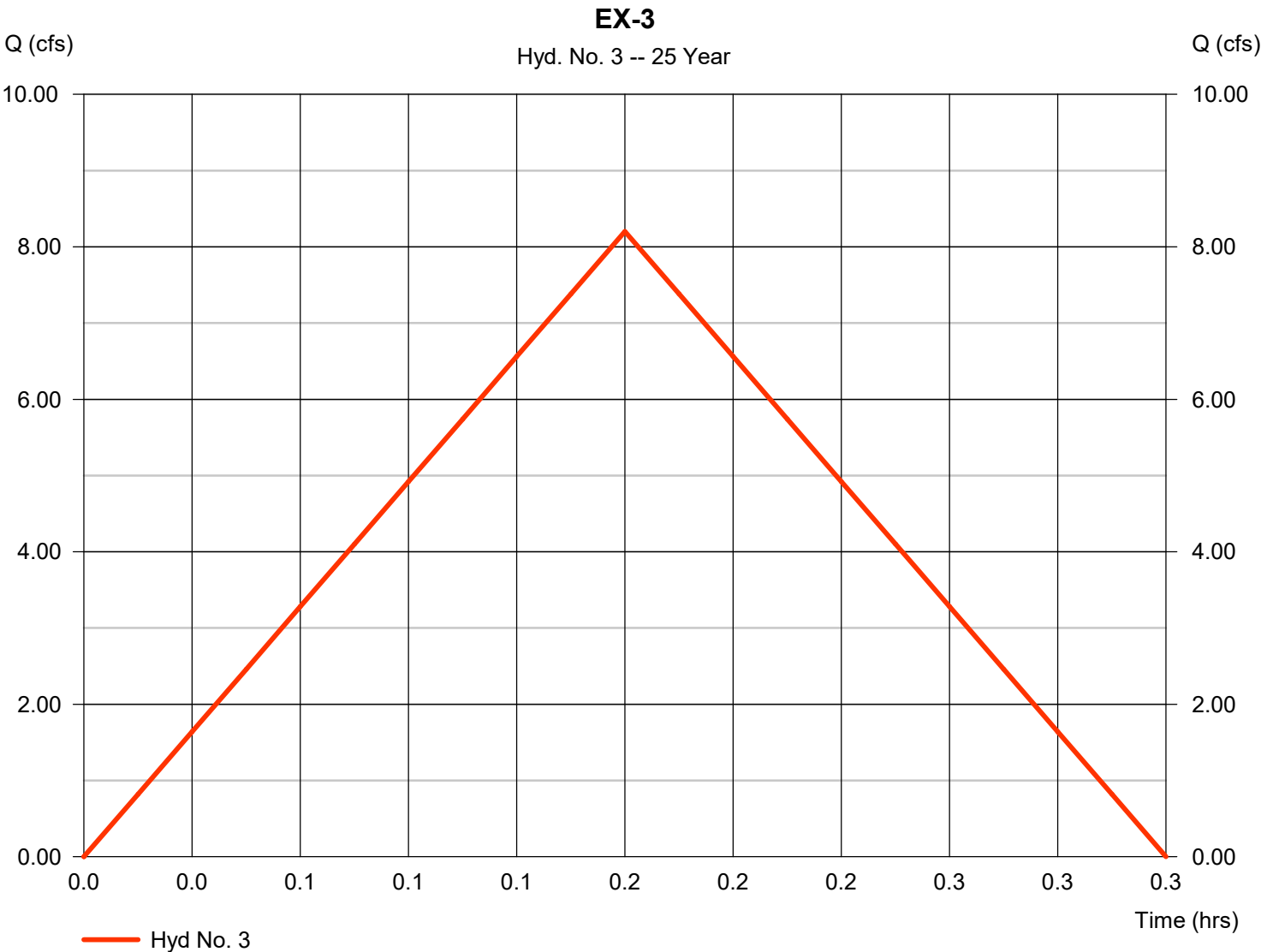


Hydrograph Report

Hyd. No. 3

EX-3

Hydrograph type	= Rational	Peak discharge	= 8.201 cfs
Storm frequency	= 25 yrs	Time to peak	= 0.17 hrs
Time interval	= 1 min	Hyd. volume	= 4,921 cuft
Drainage area	= 1.270 ac	Runoff coeff.	= 0.9
Intensity	= 7.175 in/hr	Tc by User	= 10.00 min
IDF Curve	= OKC, OK IDF.IDF	Asc/Rec limb fact	= 1/1

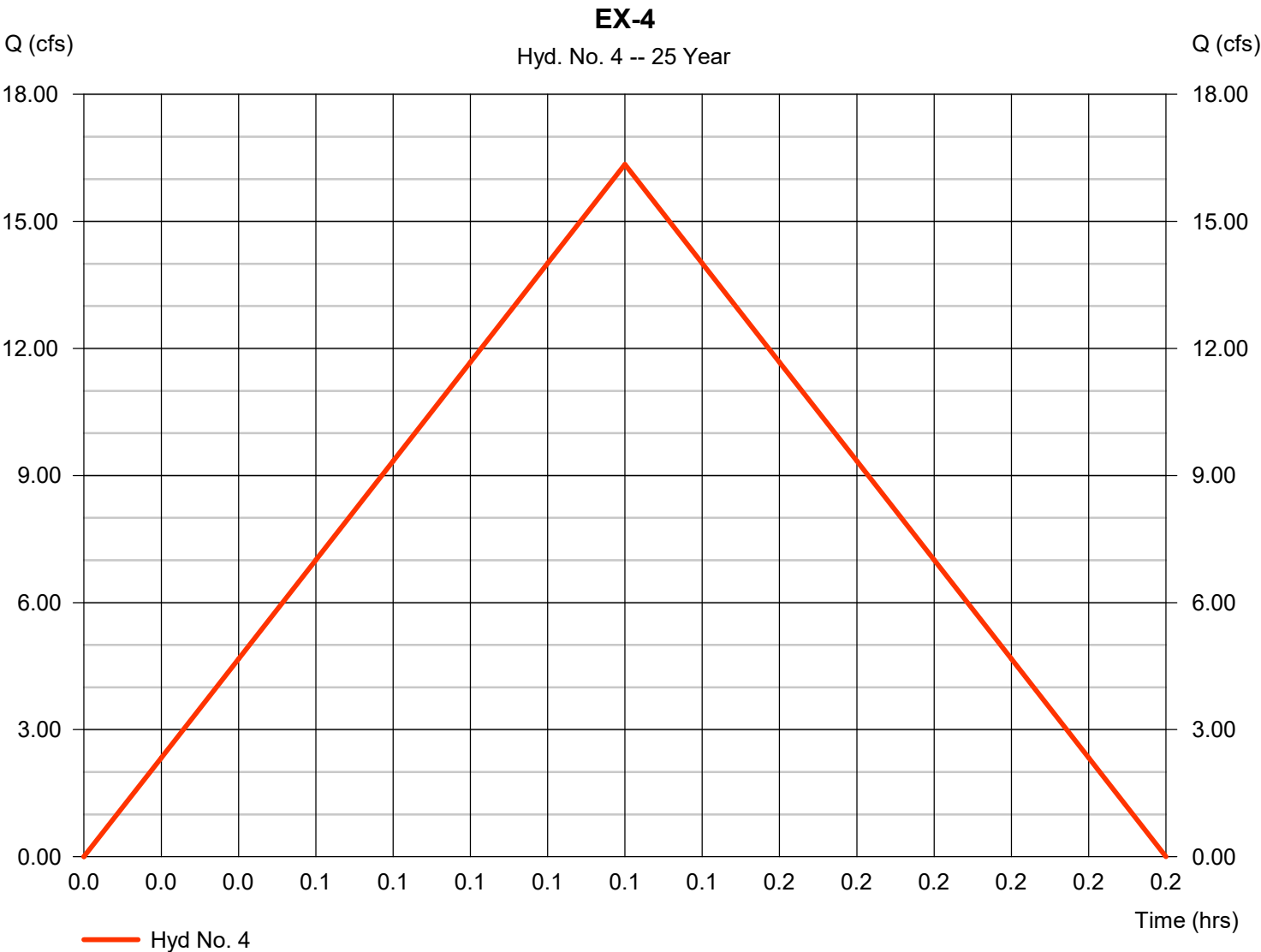


Hydrograph Report

Hyd. No. 4

EX-4

Hydrograph type	= Rational	Peak discharge	= 16.35 cfs
Storm frequency	= 25 yrs	Time to peak	= 0.12 hrs
Time interval	= 1 min	Hyd. volume	= 6,865 cuft
Drainage area	= 2.300 ac	Runoff coeff.	= 0.9
Intensity	= 7.896 in/hr	Tc by User	= 7.00 min
IDF Curve	= OKC, OK IDF.IDF	Asc/Rec limb fact	= 1/1

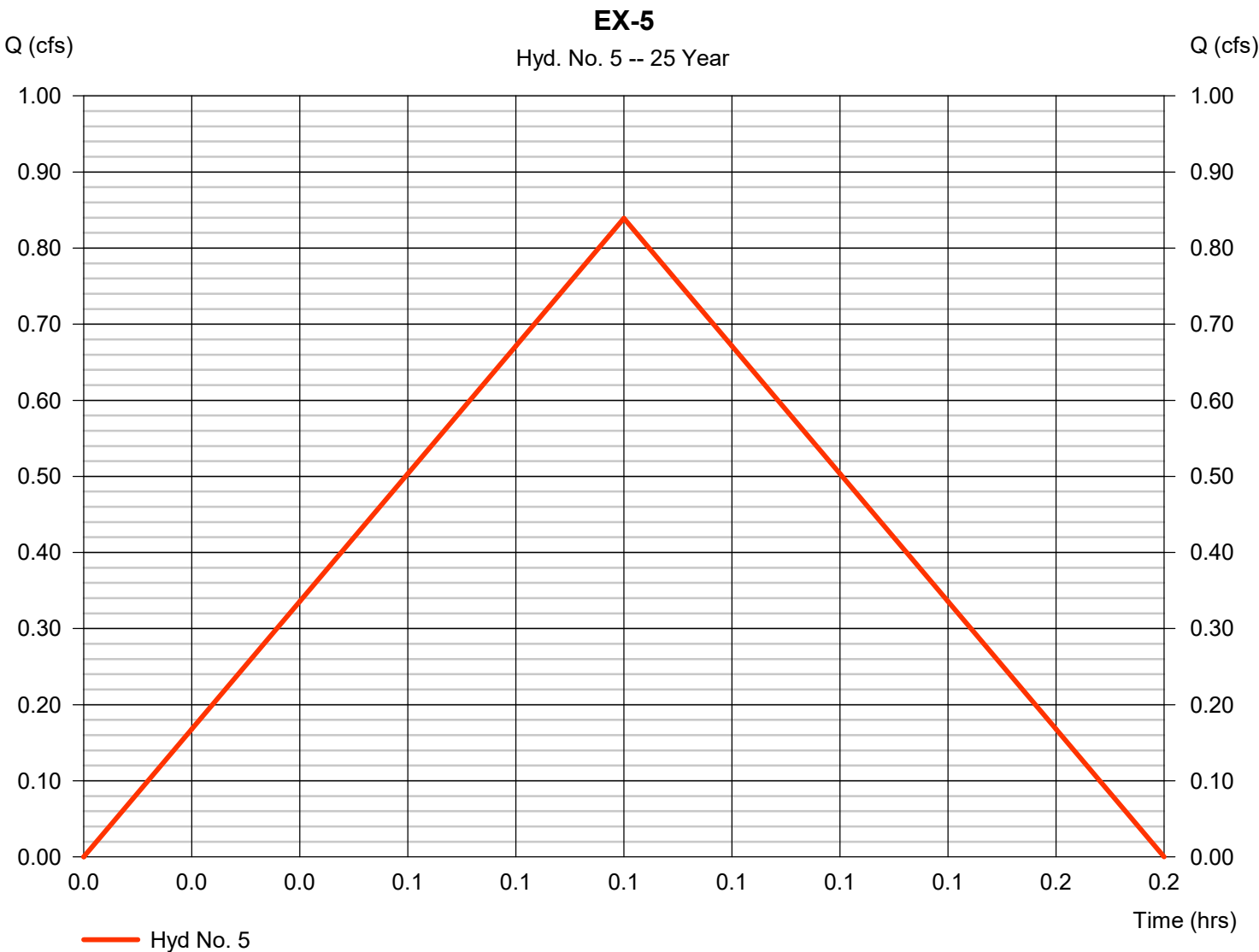


Hydrograph Report

Hyd. No. 5

EX-5

Hydrograph type	= Rational	Peak discharge	= 0.839 cfs
Storm frequency	= 25 yrs	Time to peak	= 0.08 hrs
Time interval	= 1 min	Hyd. volume	= 252 cuft
Drainage area	= 0.110 ac	Runoff coeff.	= 0.9
Intensity	= 8.476 in/hr	Tc by User	= 5.00 min
IDF Curve	= OKC, OK IDF.IDF	Asc/Rec limb fact	= 1/1

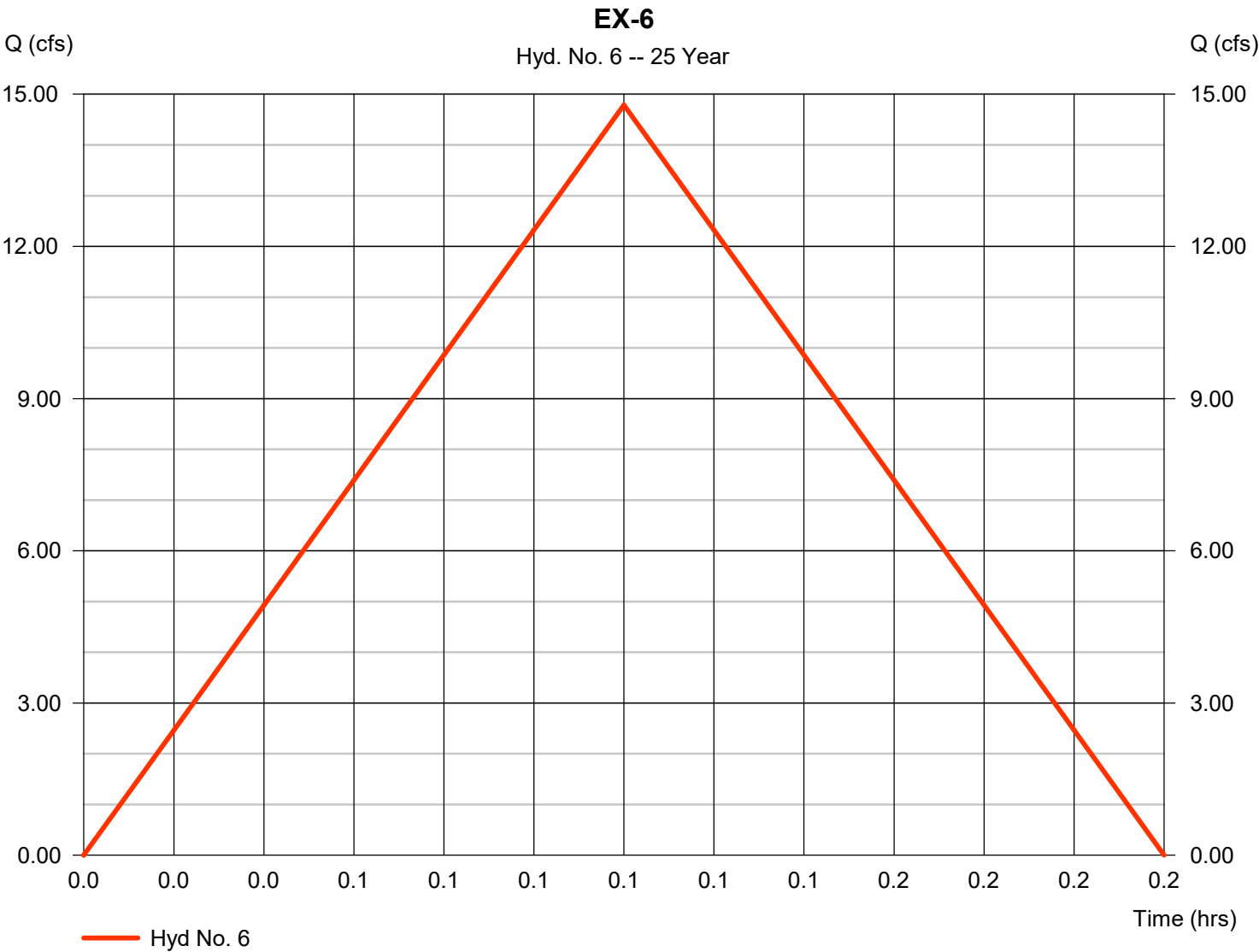


Hydrograph Report

Hyd. No. 6

EX-6

Hydrograph type	= Rational	Peak discharge	= 14.79 cfs
Storm frequency	= 25 yrs	Time to peak	= 0.10 hrs
Time interval	= 1 min	Hyd. volume	= 5,324 cuft
Drainage area	= 2.010 ac	Runoff coeff.	= 0.9
Intensity	= 8.174 in/hr	Tc by User	= 6.00 min
IDF Curve	= OKC, OK IDF.IDF	Asc/Rec limb fact	= 1/1

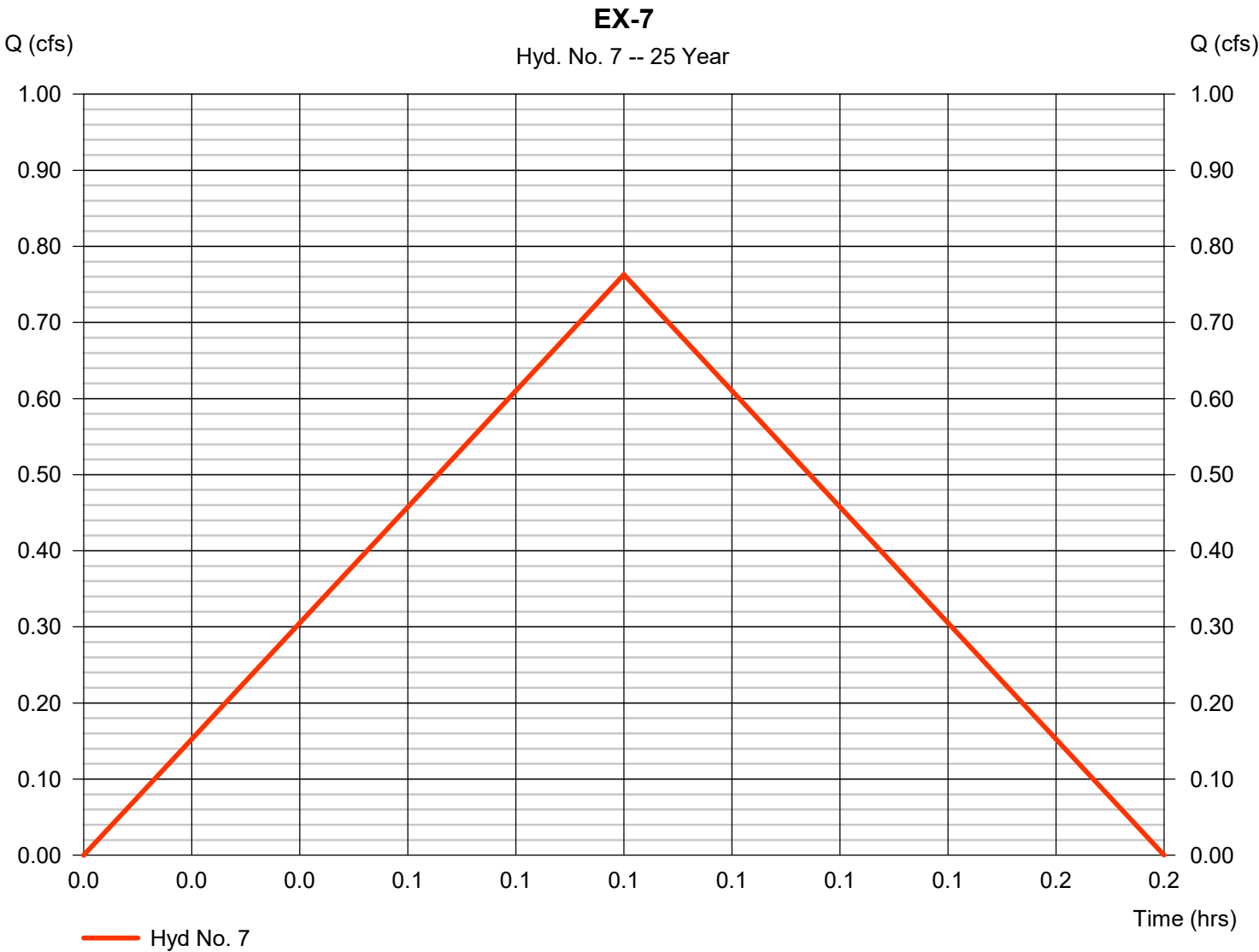


Hydrograph Report

Hyd. No. 7

EX-7

Hydrograph type	= Rational	Peak discharge	= 0.763 cfs
Storm frequency	= 25 yrs	Time to peak	= 0.08 hrs
Time interval	= 1 min	Hyd. volume	= 229 cuft
Drainage area	= 0.100 ac	Runoff coeff.	= 0.9
Intensity	= 8.476 in/hr	Tc by User	= 5.00 min
IDF Curve	= OKC, OK IDF.IDF	Asc/Rec limb fact	= 1/1

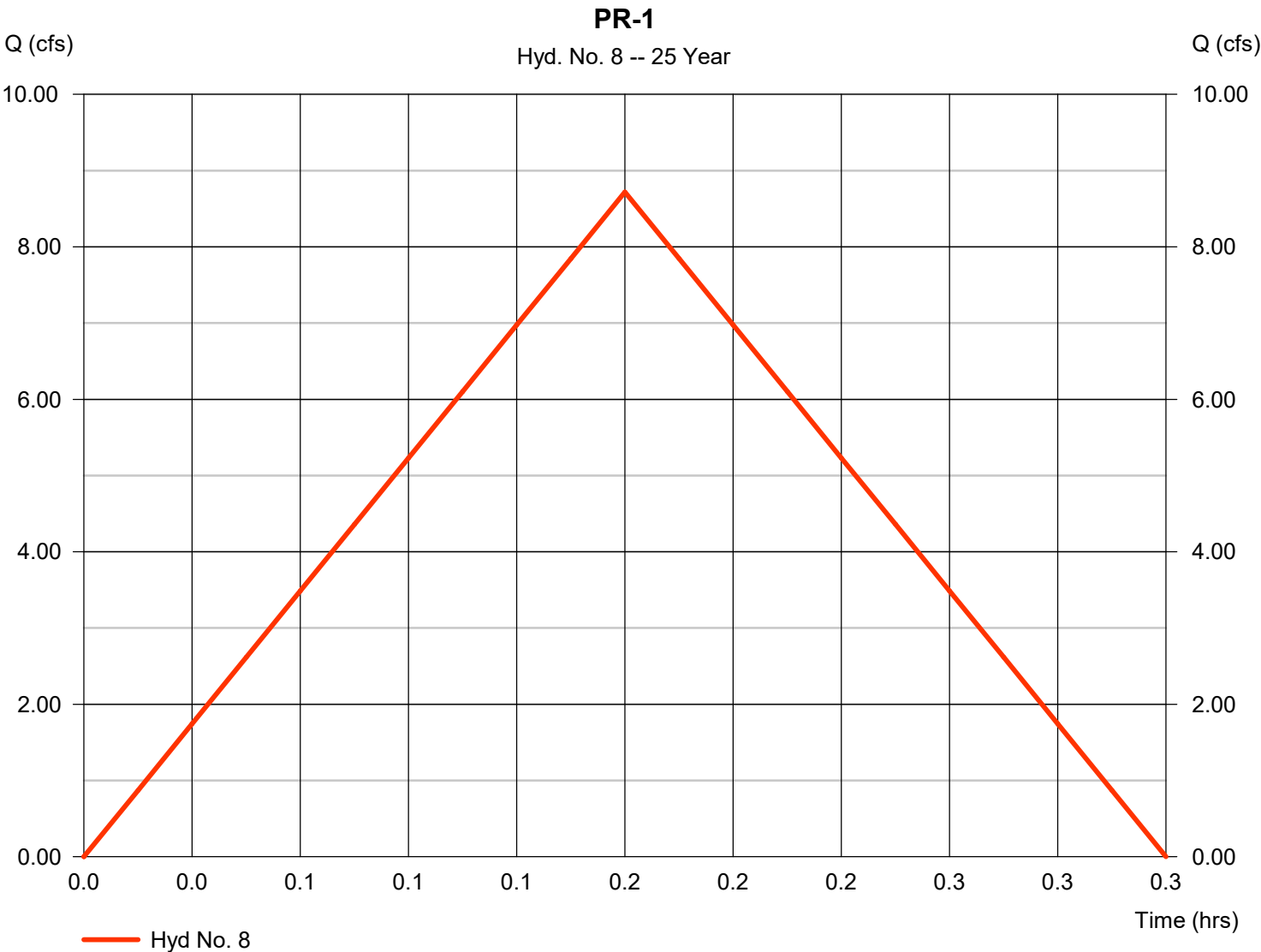


Hydrograph Report

Hyd. No. 8

PR-1

Hydrograph type	= Rational	Peak discharge	= 8.718 cfs
Storm frequency	= 25 yrs	Time to peak	= 0.17 hrs
Time interval	= 1 min	Hyd. volume	= 5,231 cuft
Drainage area	= 1.350 ac	Runoff coeff.	= 0.9
Intensity	= 7.175 in/hr	Tc by User	= 10.00 min
IDF Curve	= OKC, OK IDF.IDF	Asc/Rec limb fact	= 1/1

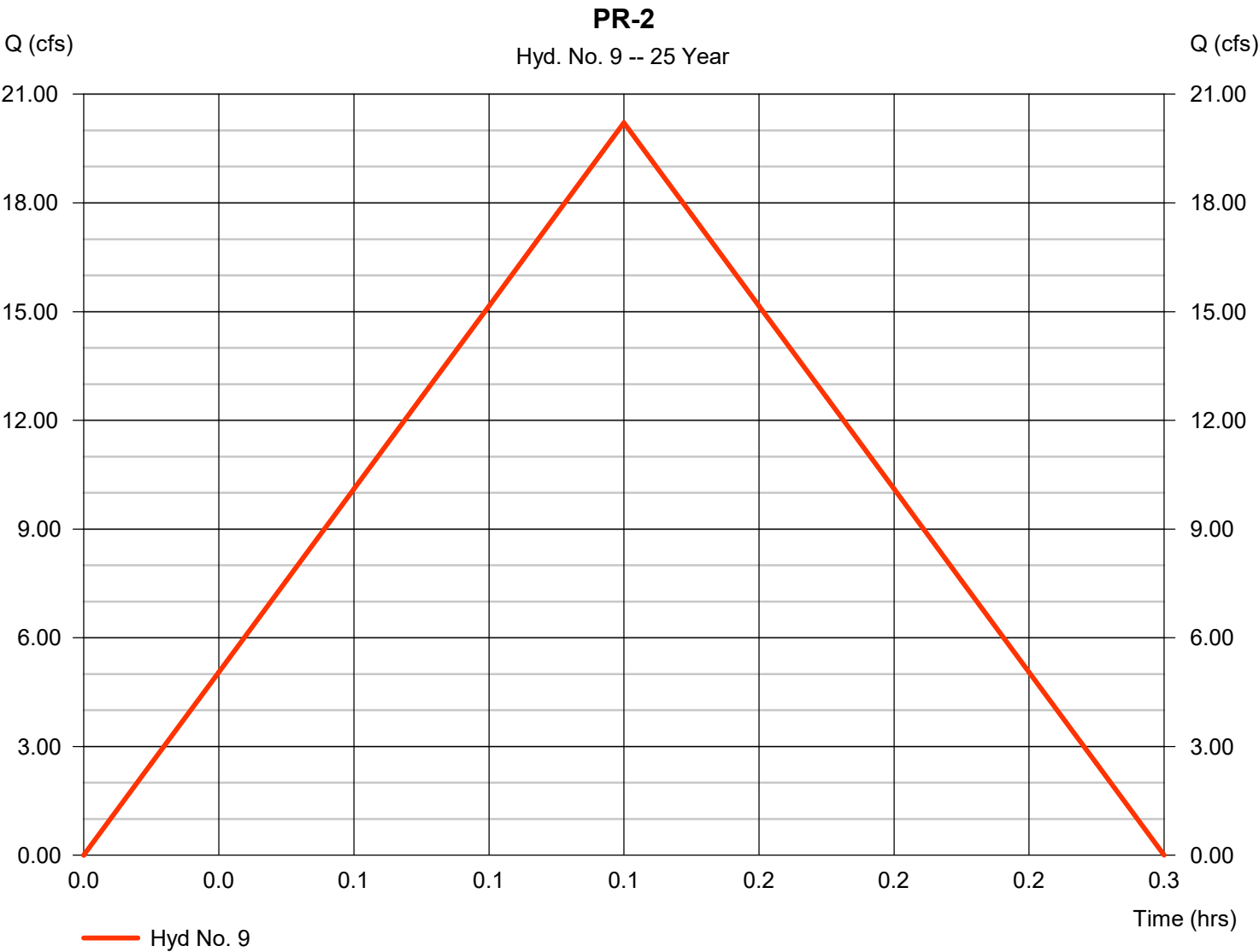


Hydrograph Report

Hyd. No. 9

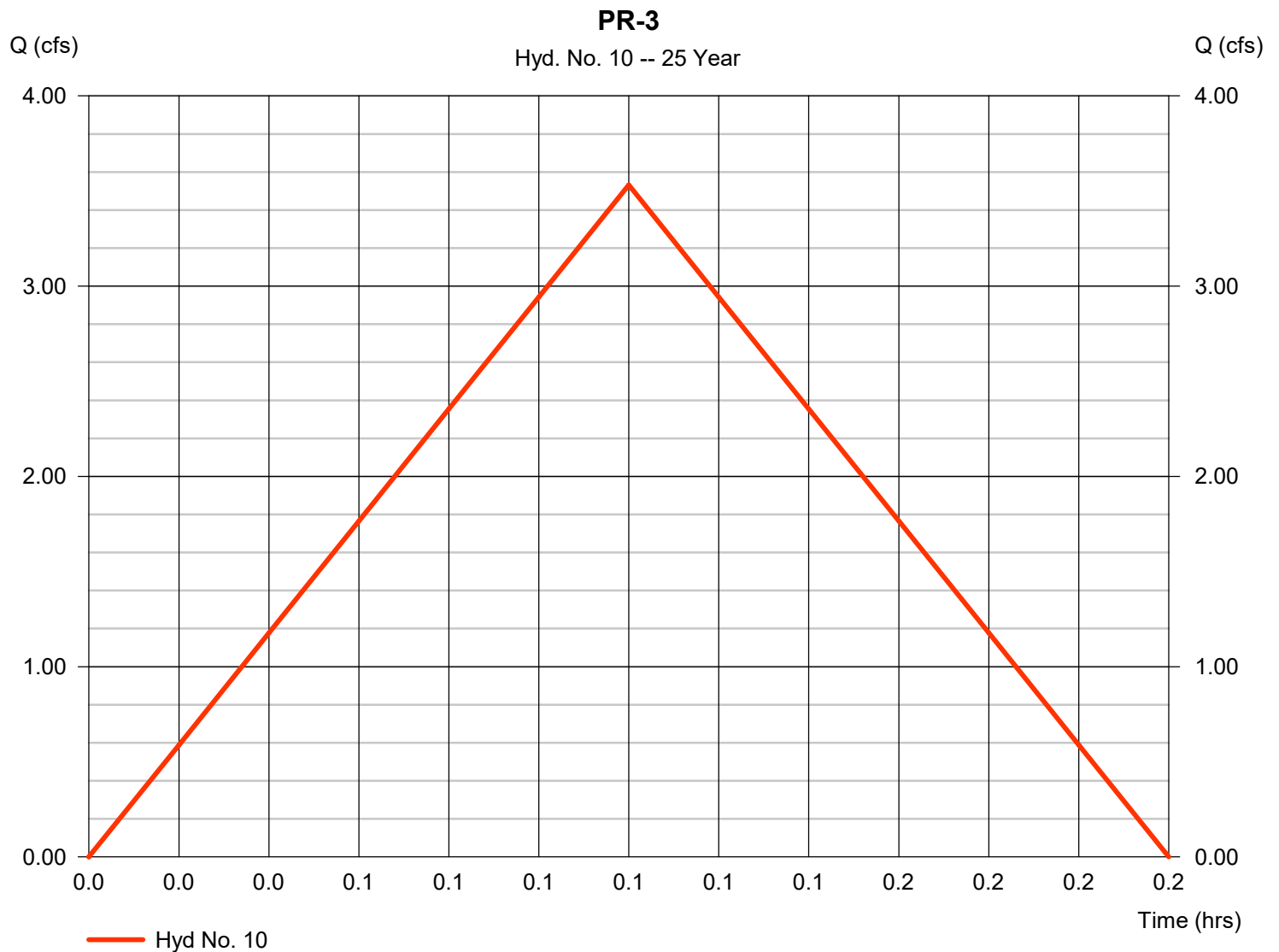
PR-2

Hydrograph type	= Rational	Peak discharge	= 20.21 cfs
Storm frequency	= 25 yrs	Time to peak	= 0.13 hrs
Time interval	= 1 min	Hyd. volume	= 9,701 cuft
Drainage area	= 2.940 ac	Runoff coeff.	= 0.9
Intensity	= 7.638 in/hr	Tc by User	= 8.00 min
IDF Curve	= OKC, OK IDF.IDF	Asc/Rec limb fact	= 1/1



Friday, 02 / 11 / 2022

Peak discharge = 3.531 cfs
Time to peak = 0.10 hrs
Hyd. volume = 1,271 cuft
Runoff coeff. = 0.9
Tc by User = 6.00 min
Asc/Rec limb fact = 1/1

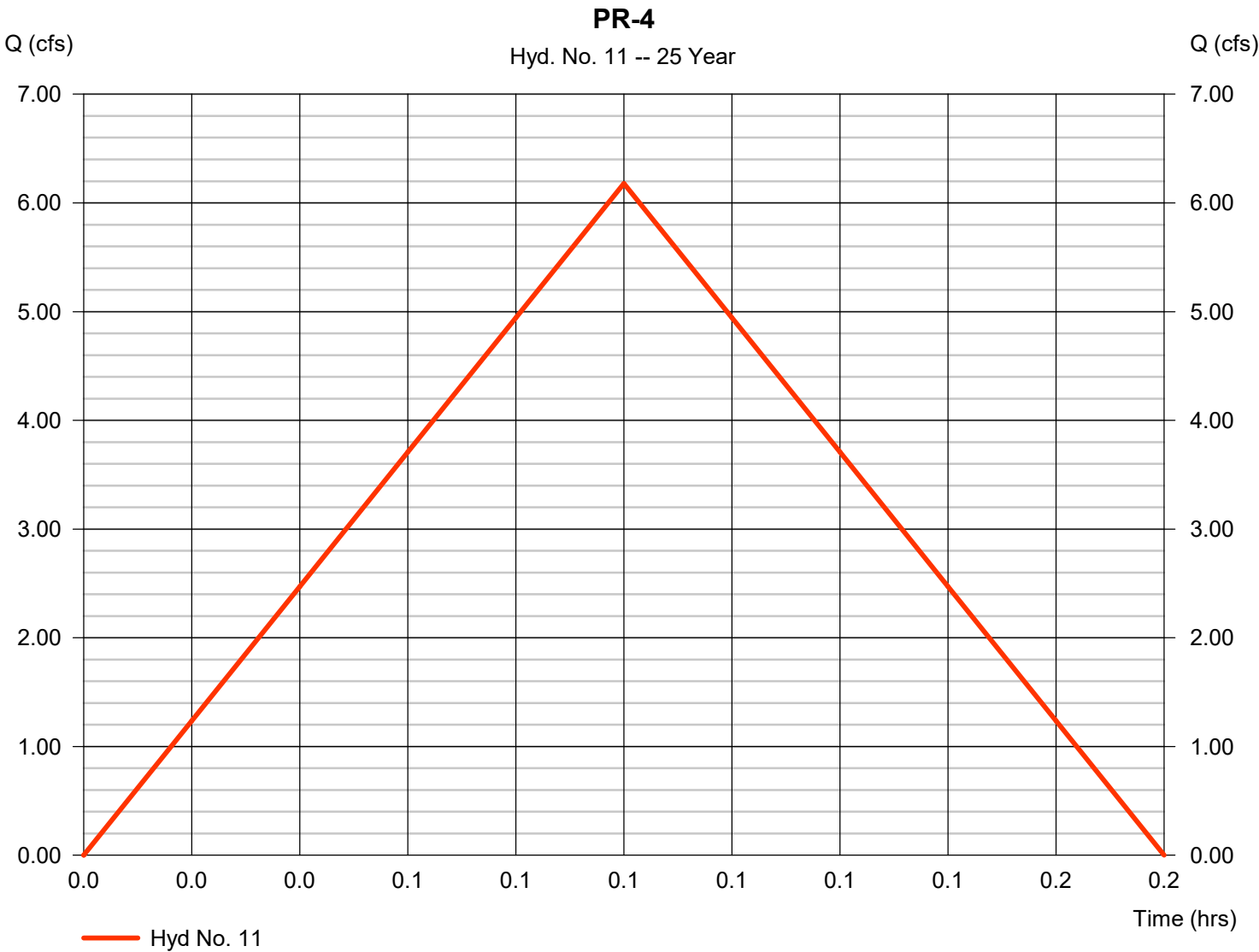


Hydrograph Report

Hyd. No. 11

PR-4

Hydrograph type	= Rational	Peak discharge	= 6.179 cfs
Storm frequency	= 25 yrs	Time to peak	= 0.08 hrs
Time interval	= 1 min	Hyd. volume	= 1,854 cuft
Drainage area	= 0.810 ac	Runoff coeff.	= 0.9
Intensity	= 8.476 in/hr	Tc by User	= 5.00 min
IDF Curve	= OKC, OK IDF.IDF	Asc/Rec limb fact	= 1/1

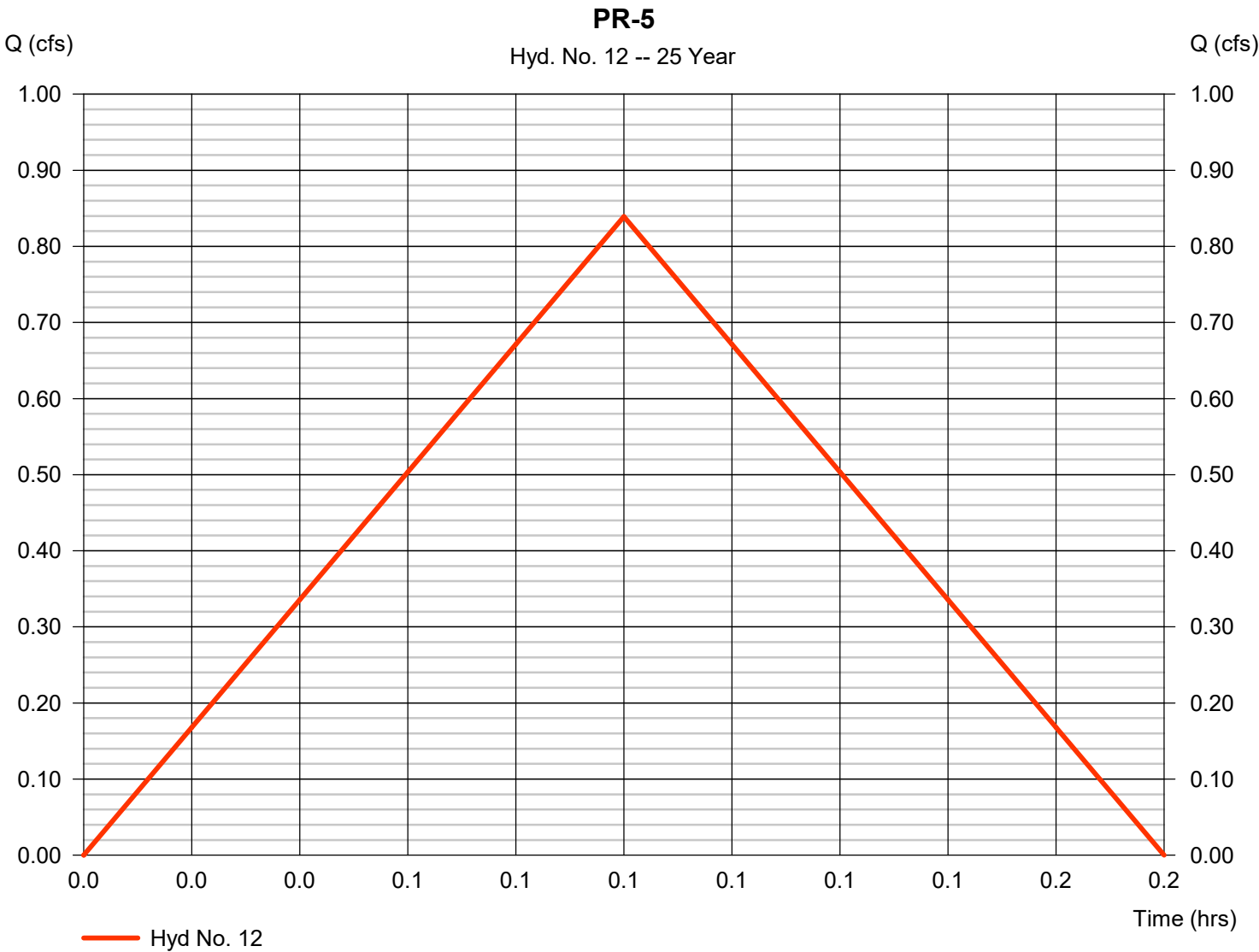


Hydrograph Report

Hyd. No. 12

PR-5

Hydrograph type	= Rational	Peak discharge	= 0.839 cfs
Storm frequency	= 25 yrs	Time to peak	= 0.08 hrs
Time interval	= 1 min	Hyd. volume	= 252 cuft
Drainage area	= 0.110 ac	Runoff coeff.	= 0.9
Intensity	= 8.476 in/hr	Tc by User	= 5.00 min
IDF Curve	= OKC, OK IDF.IDF	Asc/Rec limb fact	= 1/1

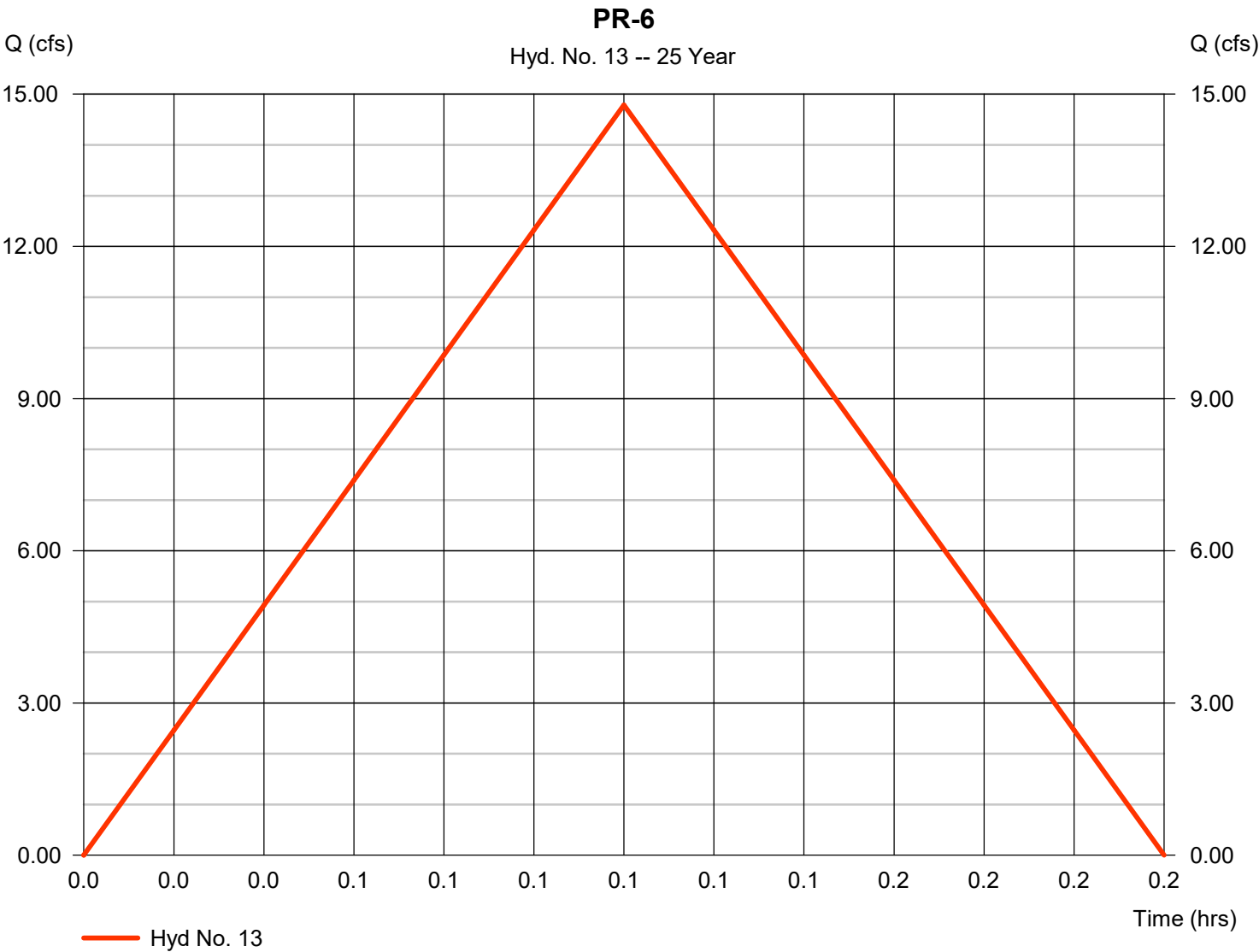


Hydrograph Report

Hyd. No. 13

PR-6

Hydrograph type	= Rational	Peak discharge	= 14.79 cfs
Storm frequency	= 25 yrs	Time to peak	= 0.10 hrs
Time interval	= 1 min	Hyd. volume	= 5,324 cuft
Drainage area	= 2.010 ac	Runoff coeff.	= 0.9
Intensity	= 8.174 in/hr	Tc by User	= 6.00 min
IDF Curve	= OKC, OK IDF.IDF	Asc/Rec limb fact	= 1/1

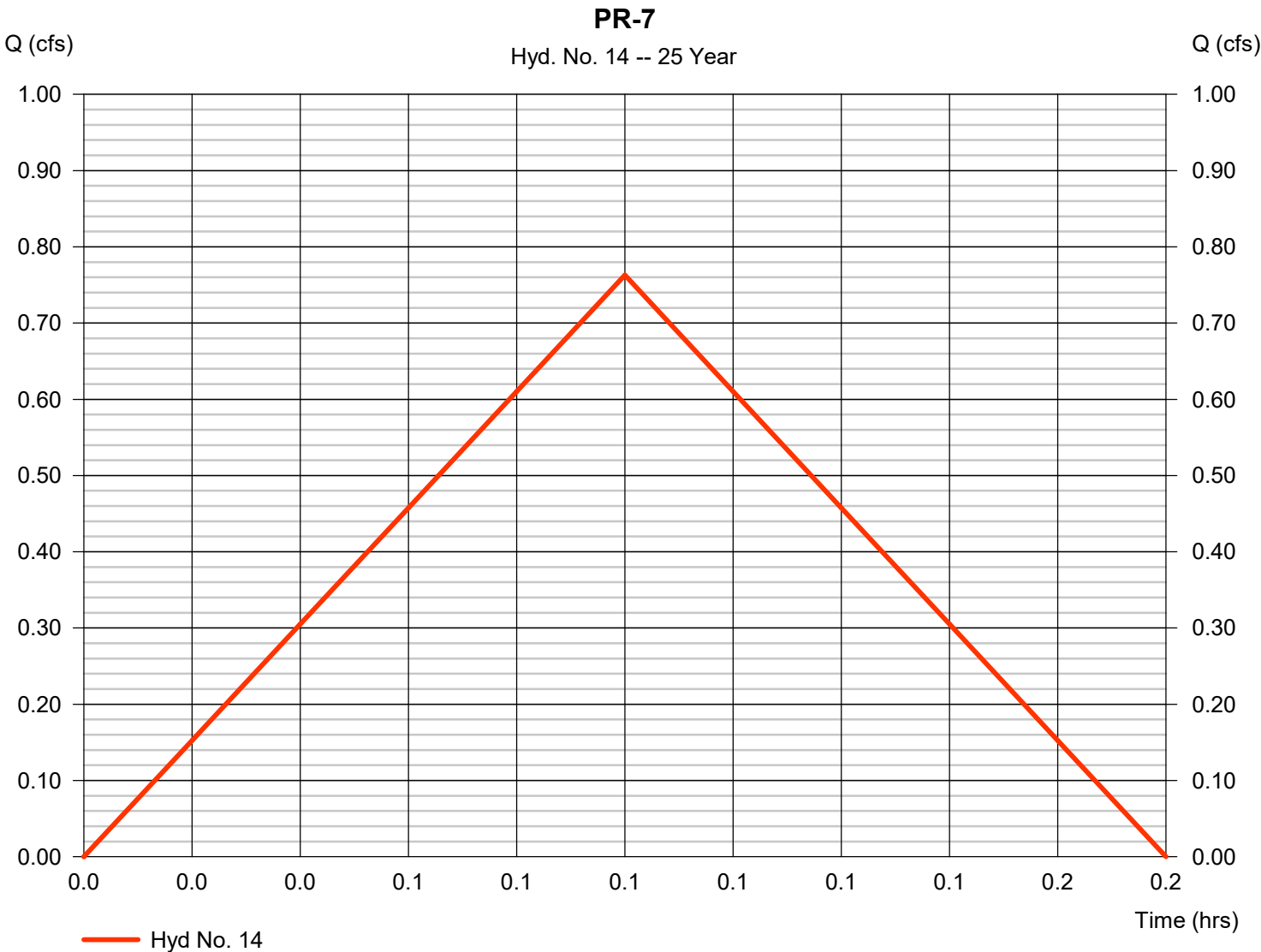


Hydrograph Report

Hyd. No. 14

PR-7

Hydrograph type	= Rational	Peak discharge	= 0.763 cfs
Storm frequency	= 25 yrs	Time to peak	= 0.08 hrs
Time interval	= 1 min	Hyd. volume	= 229 cuft
Drainage area	= 0.100 ac	Runoff coeff.	= 0.9
Intensity	= 8.476 in/hr	Tc by User	= 5.00 min
IDF Curve	= OKC, OK IDF.IDF	Asc/Rec limb fact	= 1/1

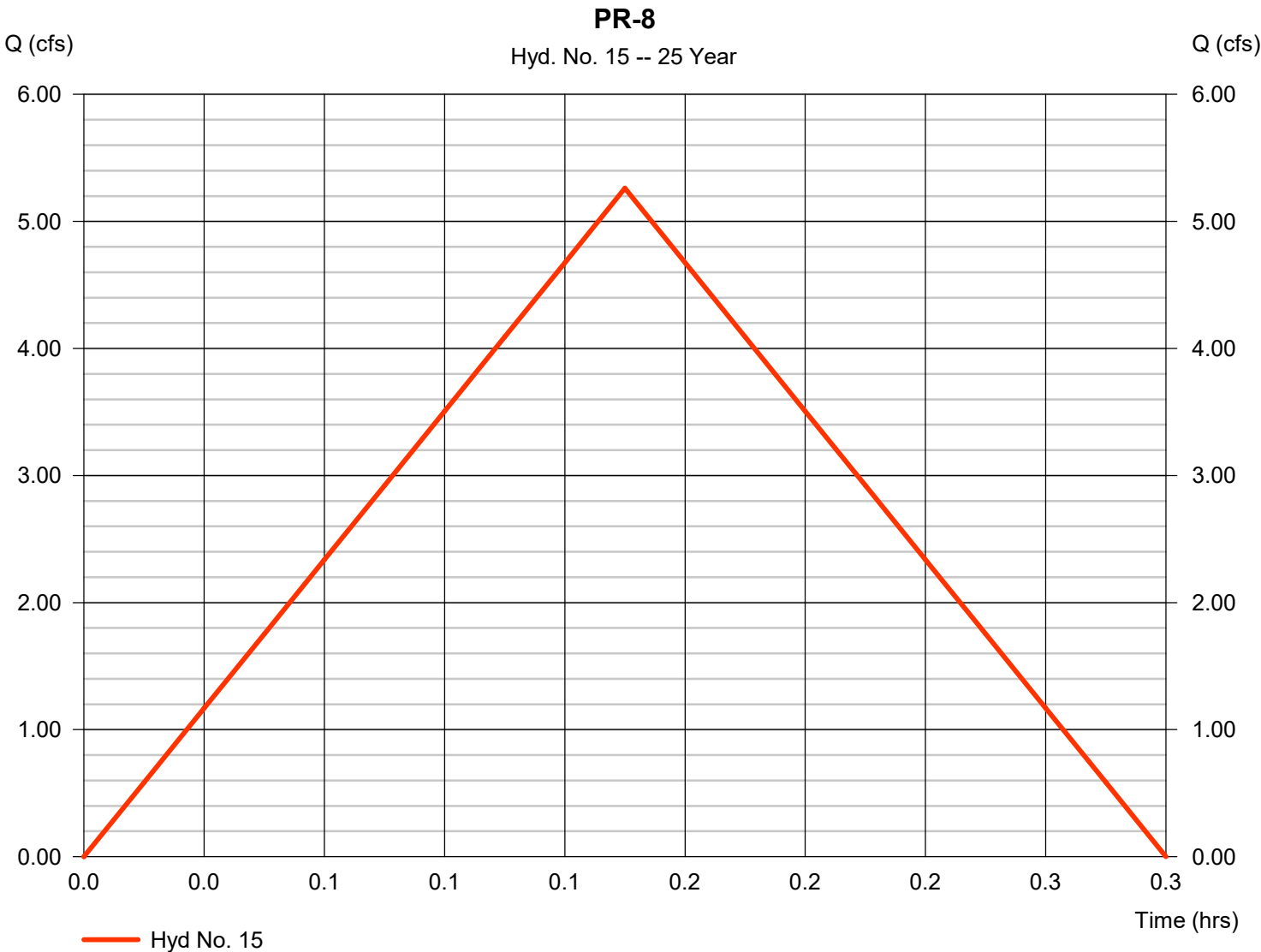


Hydrograph Report

Hyd. No. 15

PR-8

Hydrograph type	= Rational	Peak discharge	= 5.260 cfs
Storm frequency	= 25 yrs	Time to peak	= 0.15 hrs
Time interval	= 1 min	Hyd. volume	= 2,841 cuft
Drainage area	= 0.790 ac	Runoff coeff.	= 0.9
Intensity	= 7.399 in/hr	Tc by User	= 9.00 min
IDF Curve	= OKC, OK IDF.IDF	Asc/Rec limb fact	= 1/1

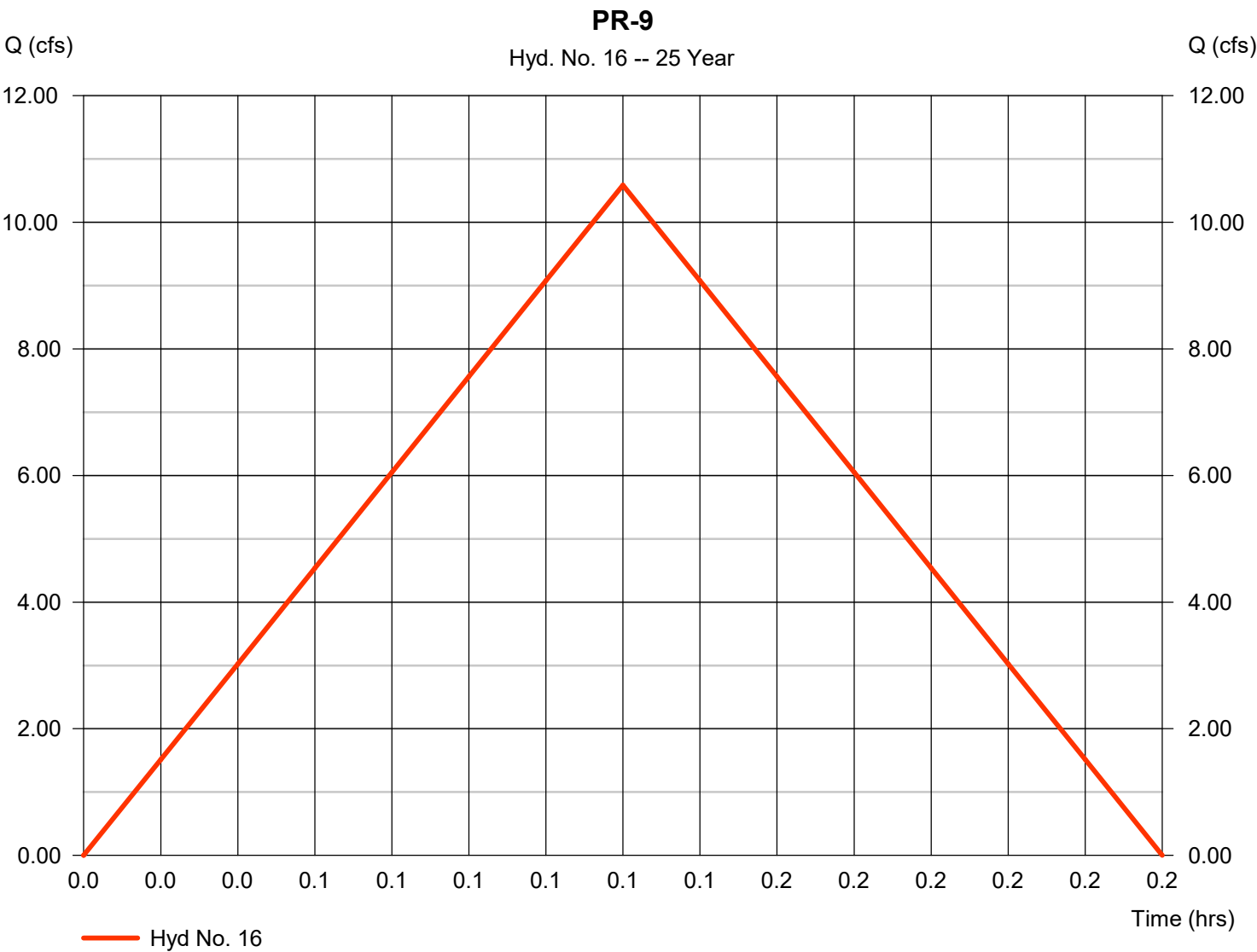


Hydrograph Report

Hyd. No. 16

PR-9

Hydrograph type	= Rational	Peak discharge	= 10.59 cfs
Storm frequency	= 25 yrs	Time to peak	= 0.12 hrs
Time interval	= 1 min	Hyd. volume	= 4,447 cuft
Drainage area	= 1.490 ac	Runoff coeff.	= 0.9
Intensity	= 7.896 in/hr	Tc by User	= 7.00 min
IDF Curve	= OKC, OK IDF.IDF	Asc/Rec limb fact	= 1/1



Hydrograph Summary Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2022

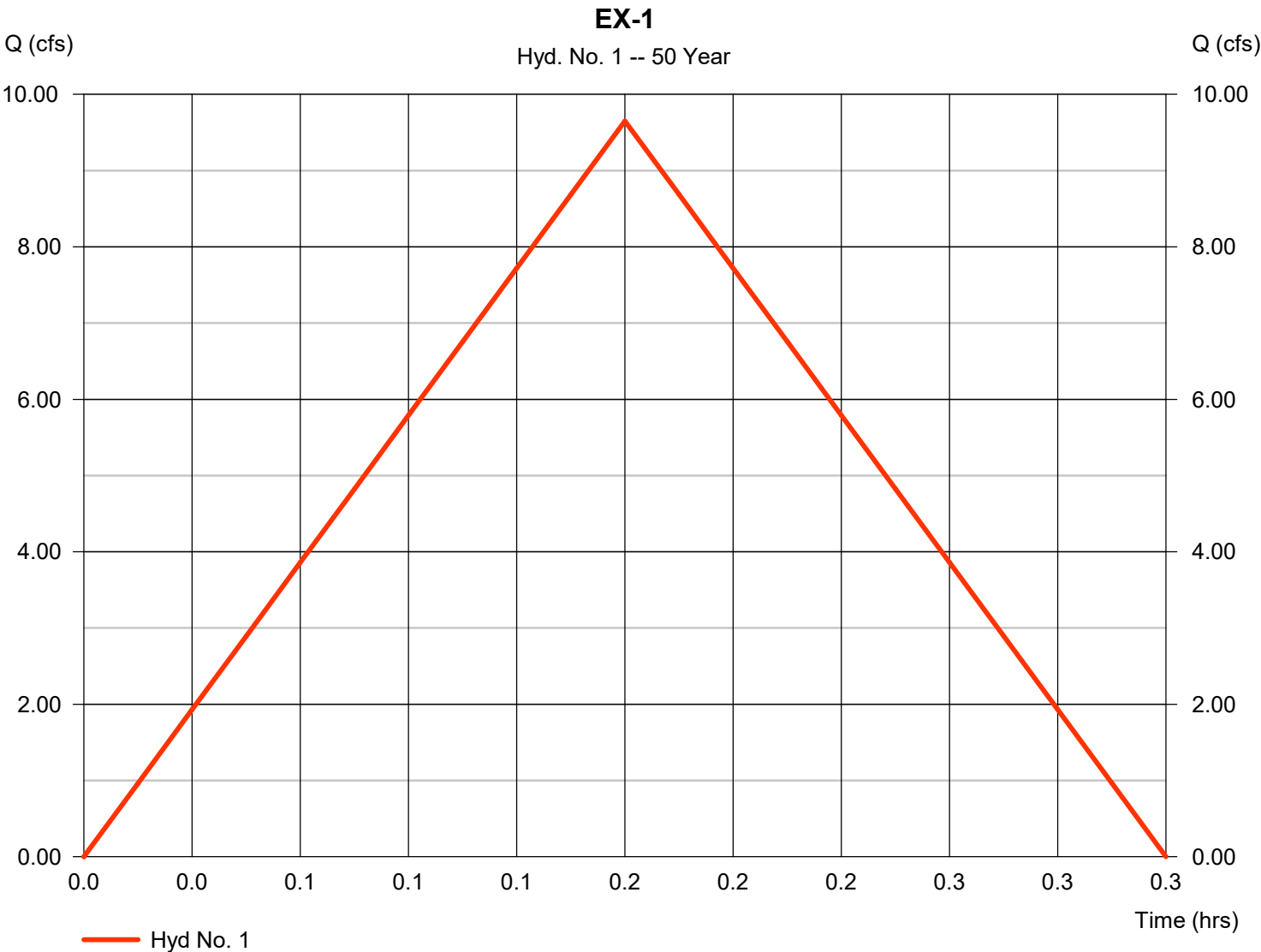
Hyd. No.	Hydrograph type (origin)	Peak flow (cfs)	Time interval (min)	Time to Peak (min)	Hyd. volume (cuft)	Inflow hyd(s)	Maximum elevation (ft)	Total strge used (cuft)	Hydrograph Description
1	Rational	9.650	1	10	5,790	-----	-----	-----	EX-1
2	Rational	22.37	1	8	10,737	-----	-----	-----	EX-2
3	Rational	9.078	1	10	5,447	-----	-----	-----	EX-3
4	Rational	18.09	1	7	7,598	-----	-----	-----	EX-4
5	Rational	0.929	1	5	279	-----	-----	-----	EX-5
6	Rational	16.37	1	6	5,892	-----	-----	-----	EX-6
7	Rational	0.844	1	5	253	-----	-----	-----	EX-7
8	Rational	9.650	1	10	5,790	-----	-----	-----	PR-1
9	Rational	22.37	1	8	10,737	-----	-----	-----	PR-2
10	Rational	3.909	1	6	1,407	-----	-----	-----	PR-3
11	Rational	6.839	1	5	2,052	-----	-----	-----	PR-4
12	Rational	0.929	1	5	279	-----	-----	-----	PR-5
13	Rational	16.37	1	6	5,892	-----	-----	-----	PR-6
14	Rational	0.844	1	5	253	-----	-----	-----	PR-7
15	Rational	5.822	1	9	3,144	-----	-----	-----	PR-8
16	Rational	11.72	1	7	4,922	-----	-----	-----	PR-9
Flows.gpw					Return Period: 50 Year			Friday, 02 / 11 / 2022	

Hydrograph Report

Hyd. No. 1

EX-1

Hydrograph type	= Rational	Peak discharge	= 9.650 cfs
Storm frequency	= 50 yrs	Time to peak	= 0.17 hrs
Time interval	= 1 min	Hyd. volume	= 5,790 cuft
Drainage area	= 1.350 ac	Runoff coeff.	= 0.9
Intensity	= 7.942 in/hr	Tc by User	= 10.00 min
IDF Curve	= OKC, OK IDF.IDF	Asc/Rec limb fact	= 1/1

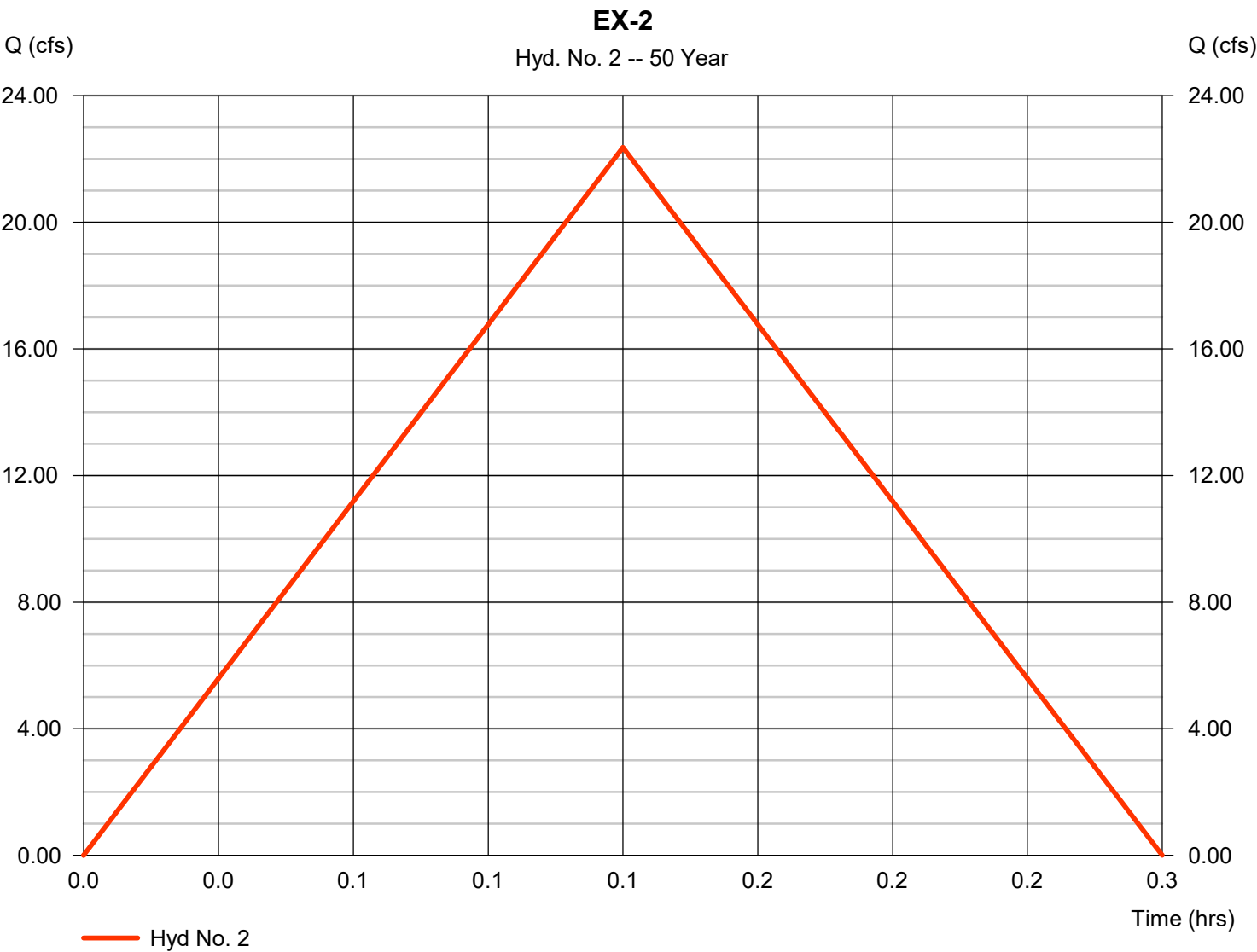


Hydrograph Report

Hyd. No. 2

EX-2

Hydrograph type	= Rational	Peak discharge	= 22.37 cfs
Storm frequency	= 50 yrs	Time to peak	= 0.13 hrs
Time interval	= 1 min	Hyd. volume	= 10,737 cuft
Drainage area	= 2.940 ac	Runoff coeff.	= 0.9
Intensity	= 8.454 in/hr	Tc by User	= 8.00 min
IDF Curve	= OKC, OK IDF.IDF	Asc/Rec limb fact	= 1/1

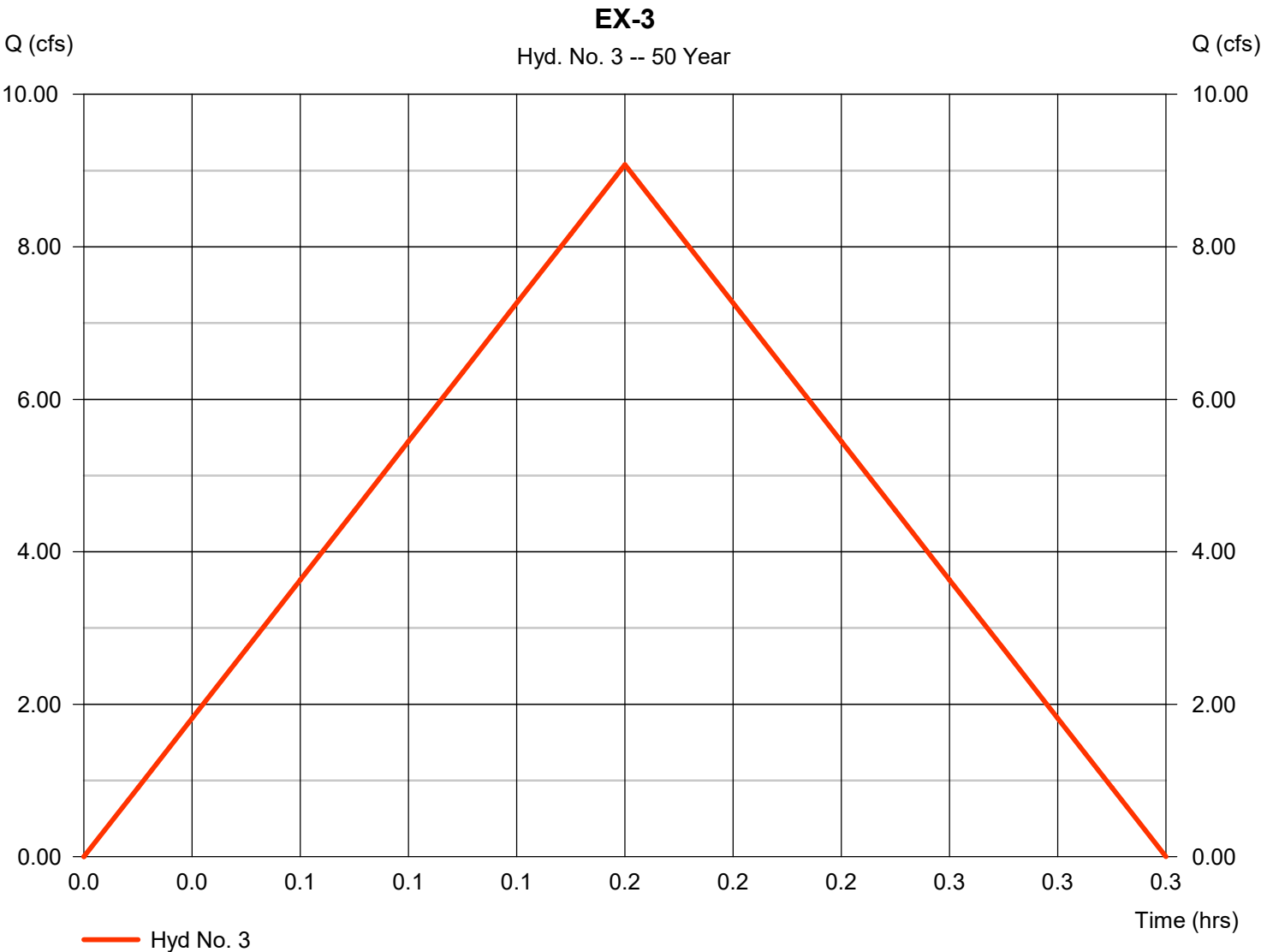


Hydrograph Report

Hyd. No. 3

EX-3

Hydrograph type	= Rational	Peak discharge	= 9.078 cfs
Storm frequency	= 50 yrs	Time to peak	= 0.17 hrs
Time interval	= 1 min	Hyd. volume	= 5,447 cuft
Drainage area	= 1.270 ac	Runoff coeff.	= 0.9
Intensity	= 7.942 in/hr	Tc by User	= 10.00 min
IDF Curve	= OKC, OK IDF.IDF	Asc/Rec limb fact	= 1/1

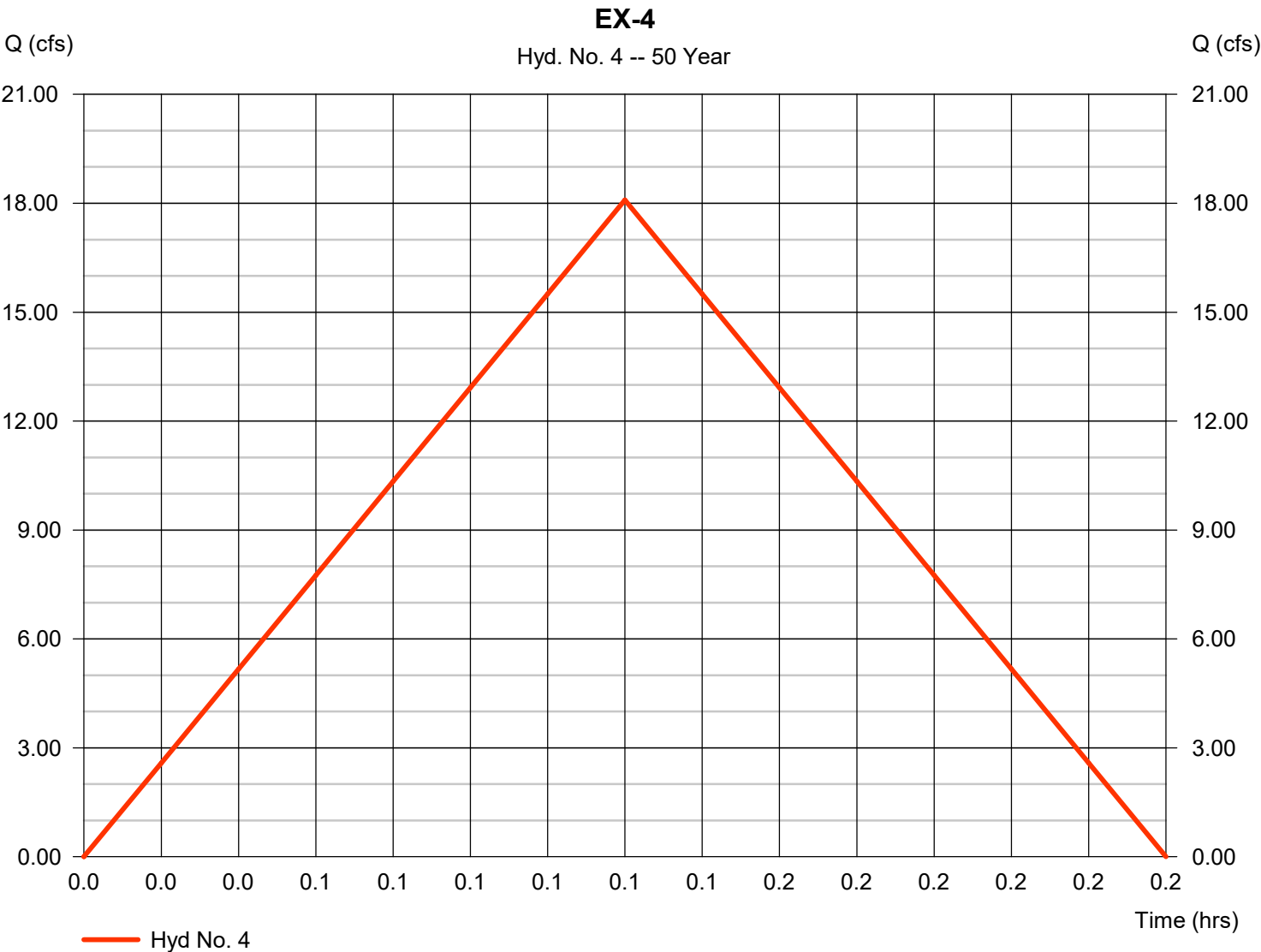


Hydrograph Report

Hyd. No. 4

EX-4

Hydrograph type	= Rational	Peak discharge	= 18.09 cfs
Storm frequency	= 50 yrs	Time to peak	= 0.12 hrs
Time interval	= 1 min	Hyd. volume	= 7,598 cuft
Drainage area	= 2.300 ac	Runoff coeff.	= 0.9
Intensity	= 8.739 in/hr	Tc by User	= 7.00 min
IDF Curve	= OKC, OK IDF.IDF	Asc/Rec limb fact	= 1/1

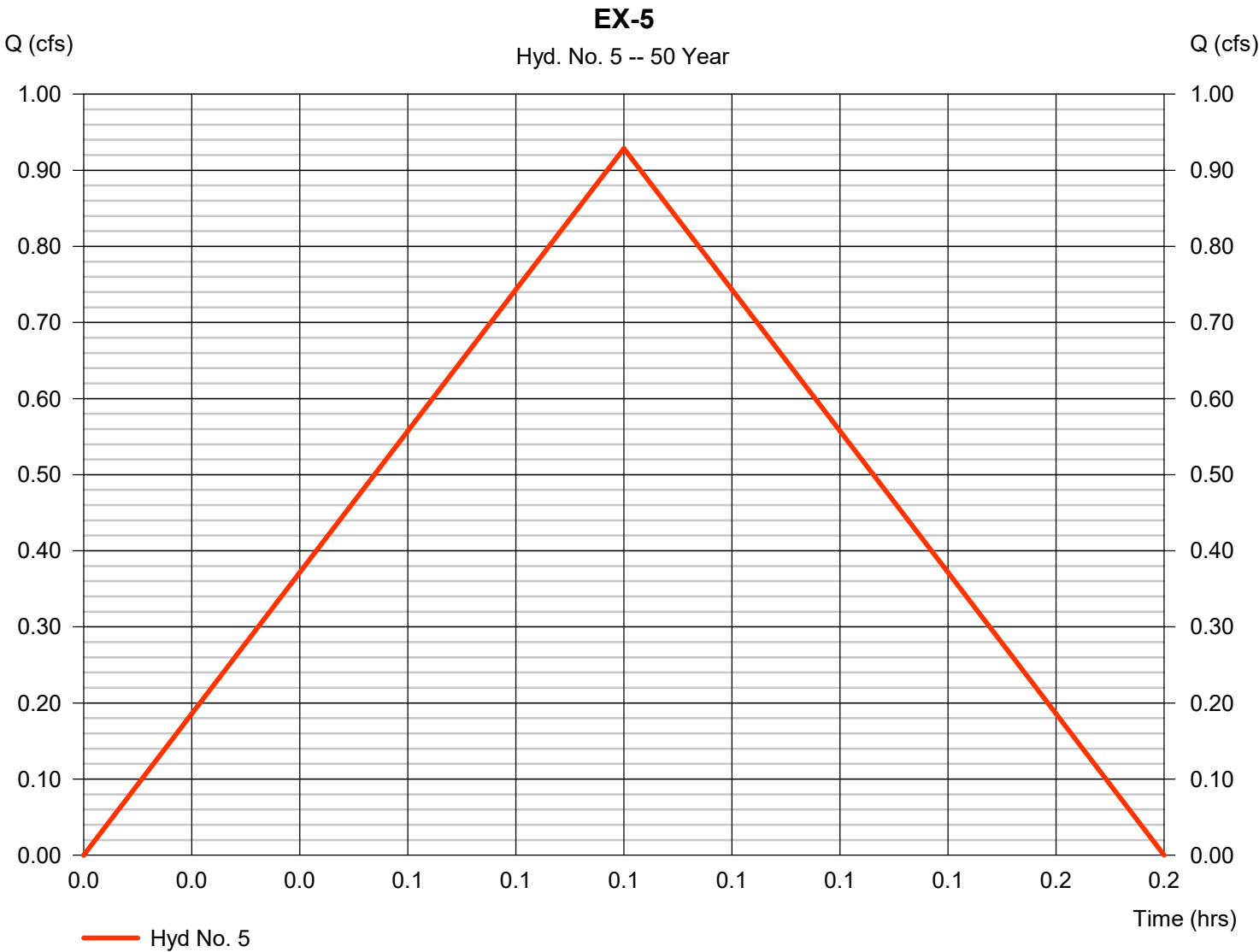


Hydrograph Report

Hyd. No. 5

EX-5

Hydrograph type	= Rational	Peak discharge	= 0.929 cfs
Storm frequency	= 50 yrs	Time to peak	= 0.08 hrs
Time interval	= 1 min	Hyd. volume	= 279 cuft
Drainage area	= 0.110 ac	Runoff coeff.	= 0.9
Intensity	= 9.382 in/hr	Tc by User	= 5.00 min
IDF Curve	= OKC, OK IDF.IDF	Asc/Rec limb fact	= 1/1

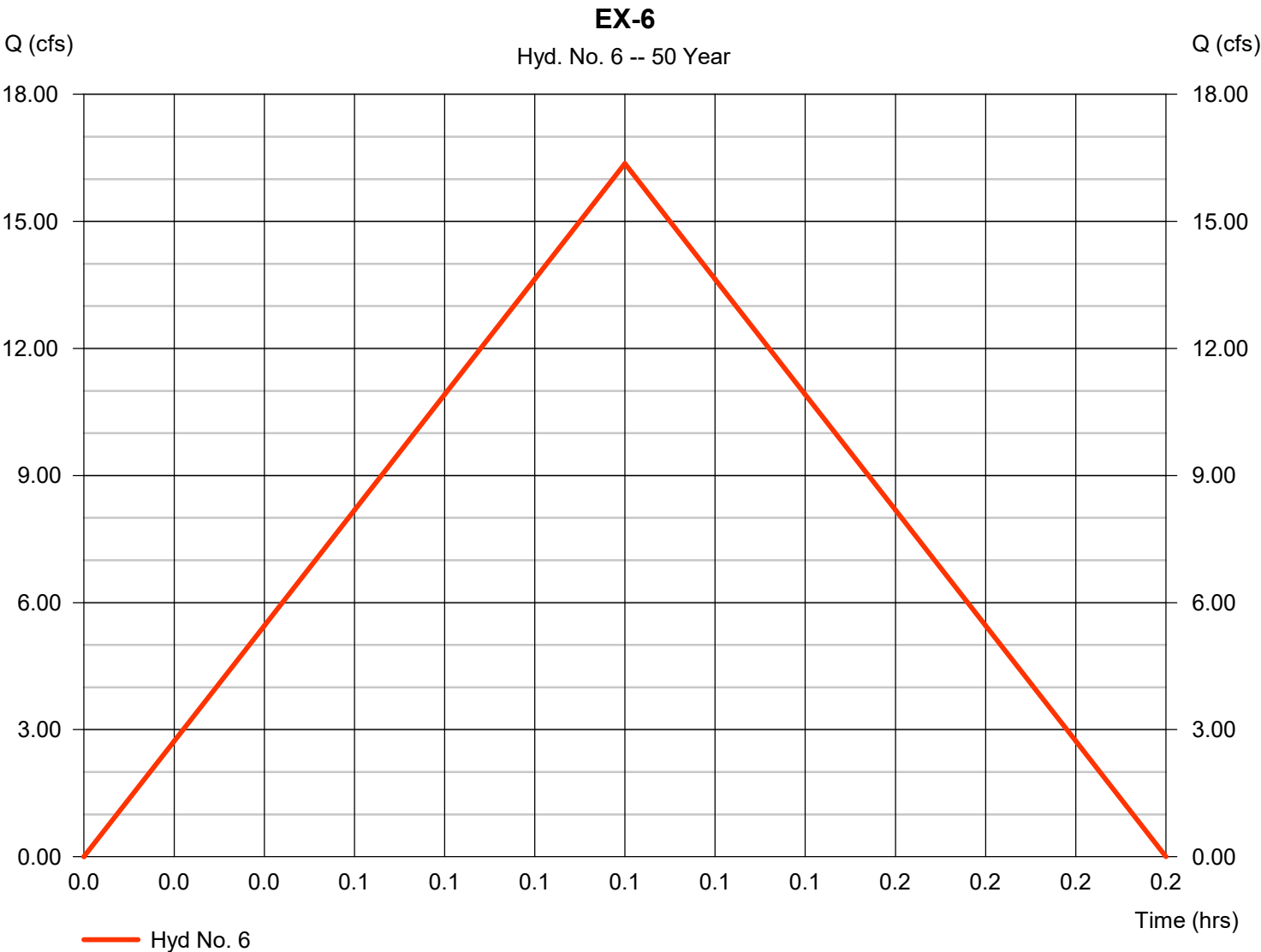


Hydrograph Report

Hyd. No. 6

EX-6

Hydrograph type	= Rational	Peak discharge	= 16.37 cfs
Storm frequency	= 50 yrs	Time to peak	= 0.10 hrs
Time interval	= 1 min	Hyd. volume	= 5,892 cuft
Drainage area	= 2.010 ac	Runoff coeff.	= 0.9
Intensity	= 9.048 in/hr	Tc by User	= 6.00 min
IDF Curve	= OKC, OK IDF.IDF	Asc/Rec limb fact	= 1/1

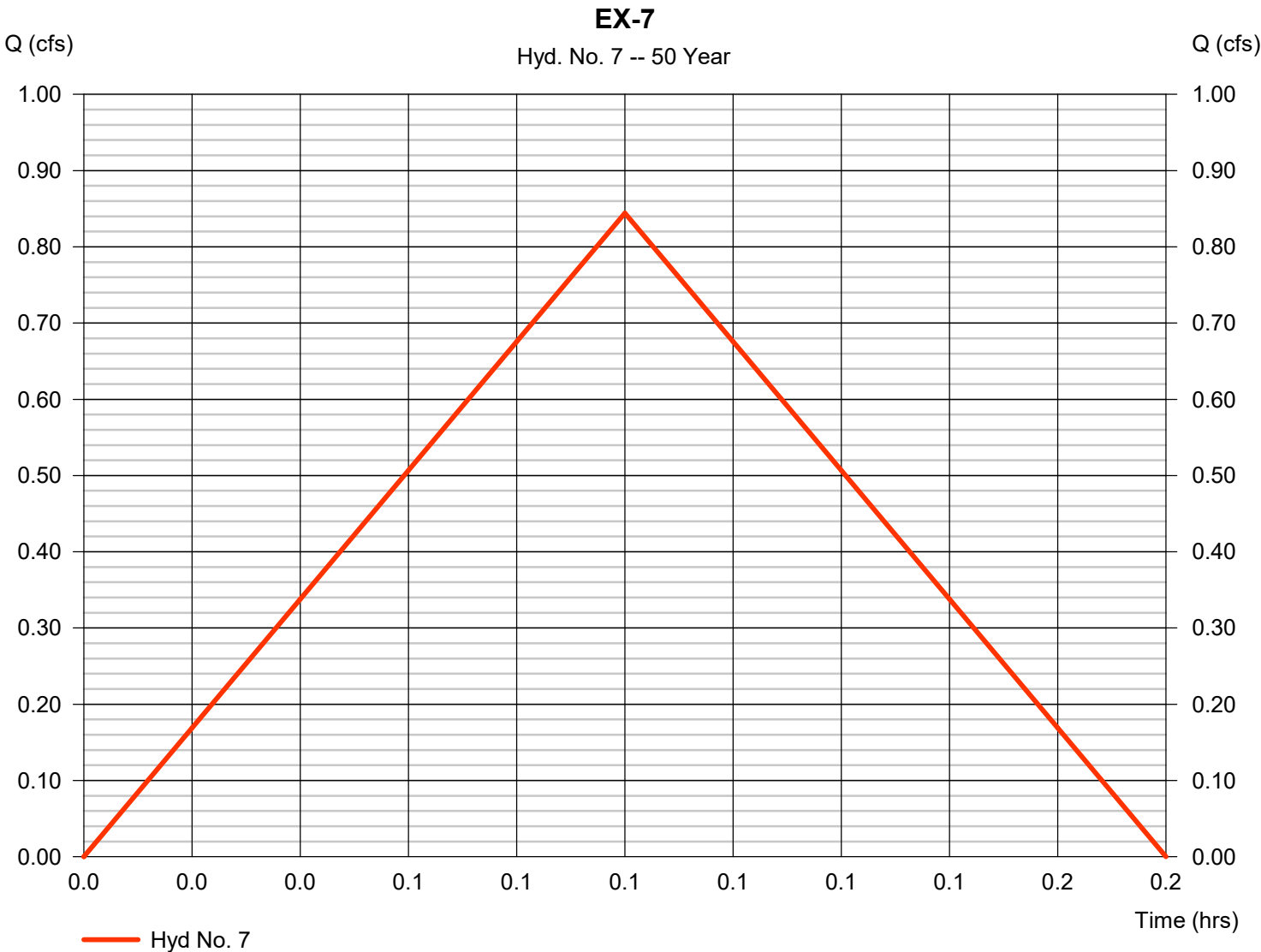


Hydrograph Report

Hyd. No. 7

EX-7

Hydrograph type	= Rational	Peak discharge	= 0.844 cfs
Storm frequency	= 50 yrs	Time to peak	= 0.08 hrs
Time interval	= 1 min	Hyd. volume	= 253 cuft
Drainage area	= 0.100 ac	Runoff coeff.	= 0.9
Intensity	= 9.382 in/hr	Tc by User	= 5.00 min
IDF Curve	= OKC, OK IDF.IDF	Asc/Rec limb fact	= 1/1

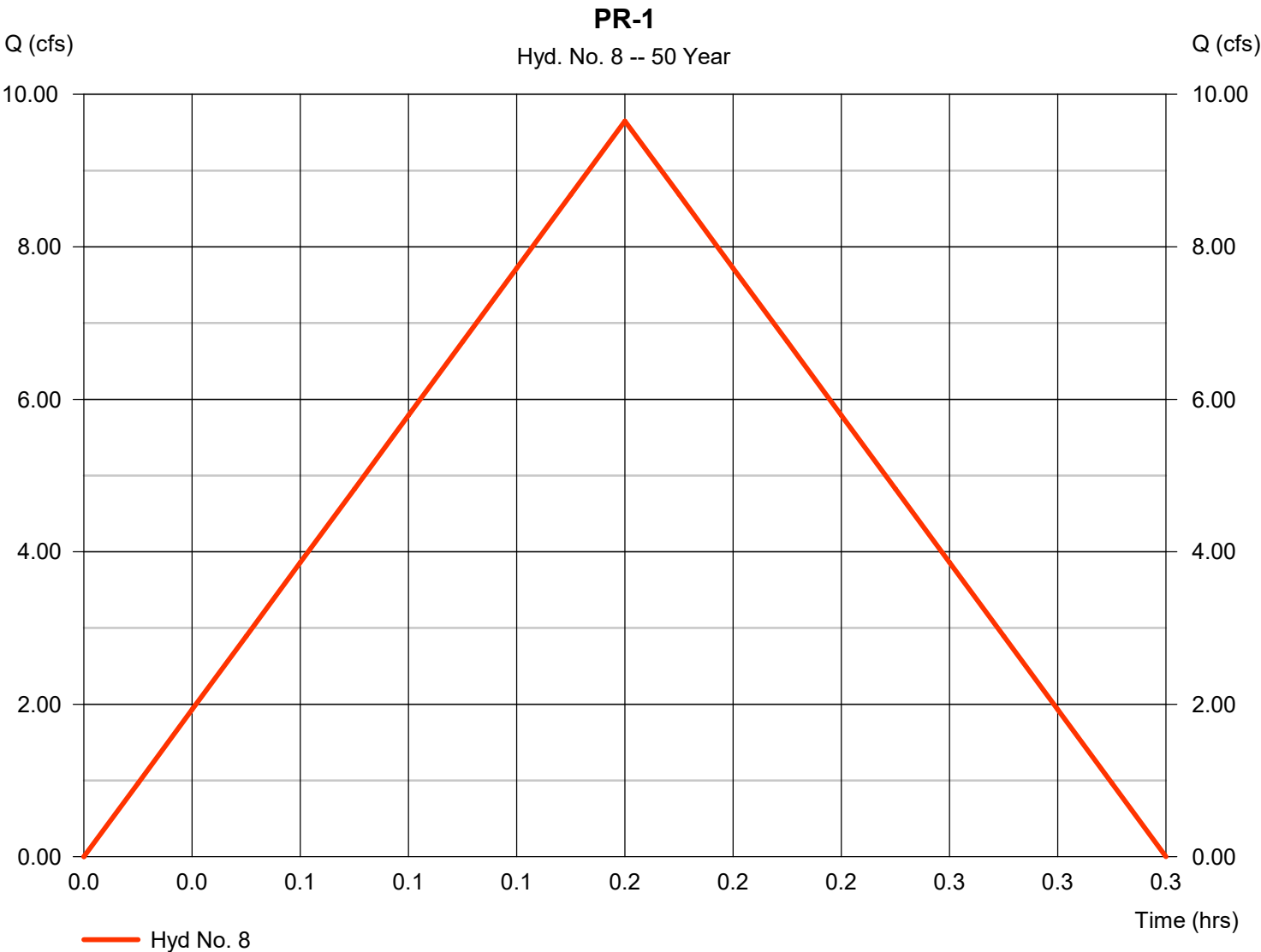


Hydrograph Report

Hyd. No. 8

PR-1

Hydrograph type	= Rational	Peak discharge	= 9.650 cfs
Storm frequency	= 50 yrs	Time to peak	= 0.17 hrs
Time interval	= 1 min	Hyd. volume	= 5,790 cuft
Drainage area	= 1.350 ac	Runoff coeff.	= 0.9
Intensity	= 7.942 in/hr	Tc by User	= 10.00 min
IDF Curve	= OKC, OK IDF.IDF	Asc/Rec limb fact	= 1/1

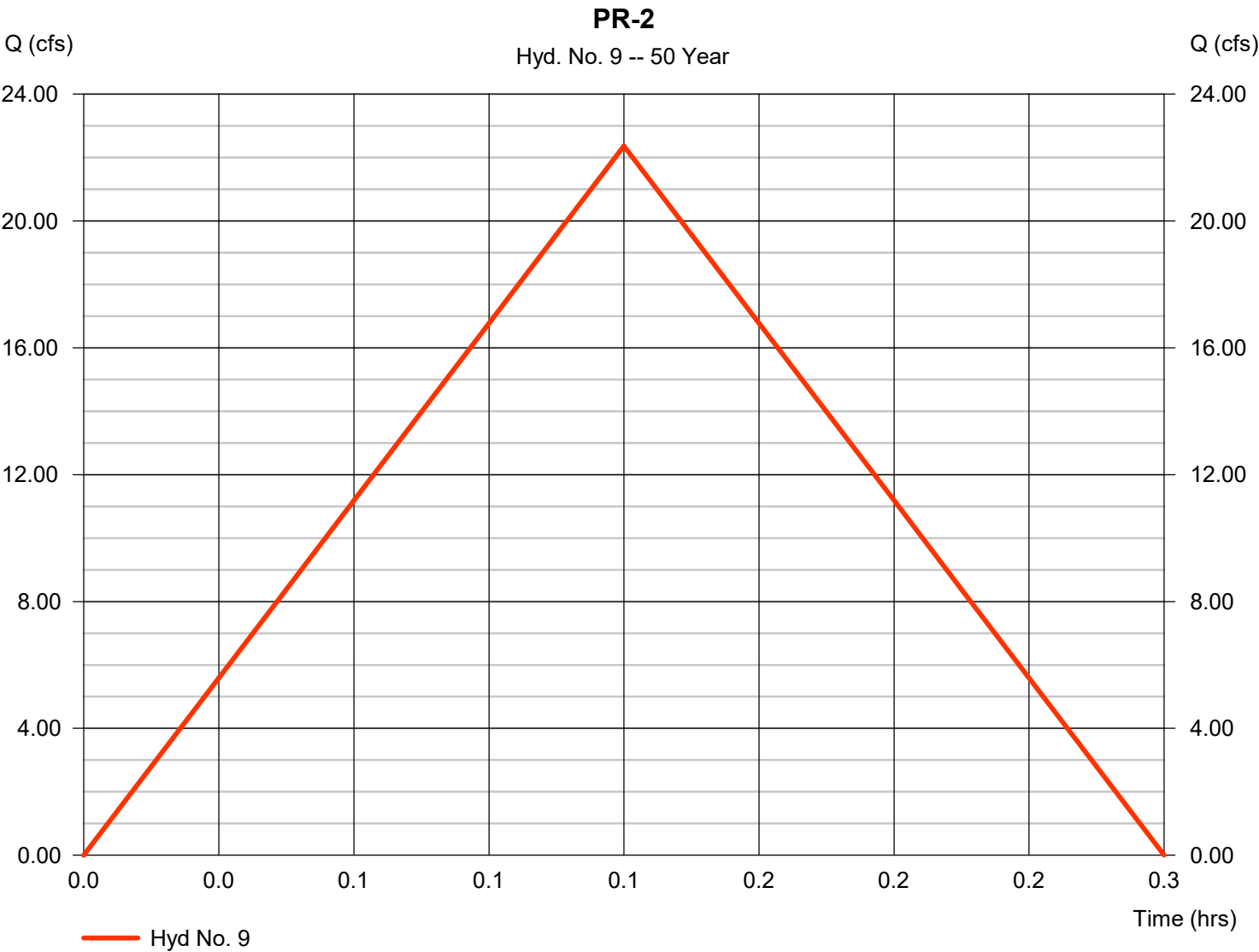


Hydrograph Report

Hyd. No. 9

PR-2

Hydrograph type	= Rational	Peak discharge	= 22.37 cfs
Storm frequency	= 50 yrs	Time to peak	= 0.13 hrs
Time interval	= 1 min	Hyd. volume	= 10,737 cuft
Drainage area	= 2.940 ac	Runoff coeff.	= 0.9
Intensity	= 8.454 in/hr	Tc by User	= 8.00 min
IDF Curve	= OKC, OK IDF.IDF	Asc/Rec limb fact	= 1/1

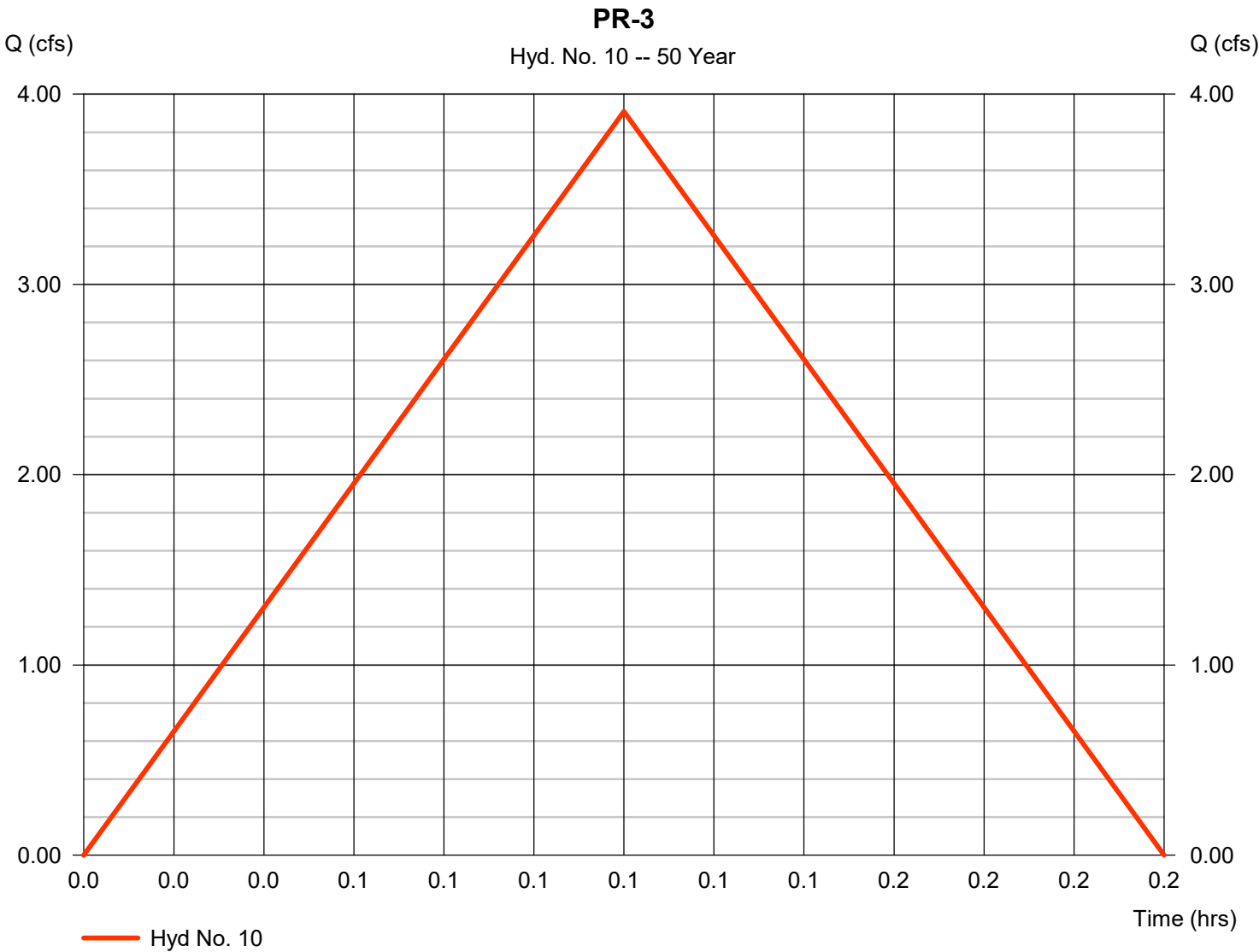


Hydrograph Report

Hyd. No. 10

PR-3

Hydrograph type	= Rational	Peak discharge	= 3.909 cfs
Storm frequency	= 50 yrs	Time to peak	= 0.10 hrs
Time interval	= 1 min	Hyd. volume	= 1,407 cuft
Drainage area	= 0.480 ac	Runoff coeff.	= 0.9
Intensity	= 9.048 in/hr	Tc by User	= 6.00 min
IDF Curve	= OKC, OK IDF.IDF	Asc/Rec limb fact	= 1/1

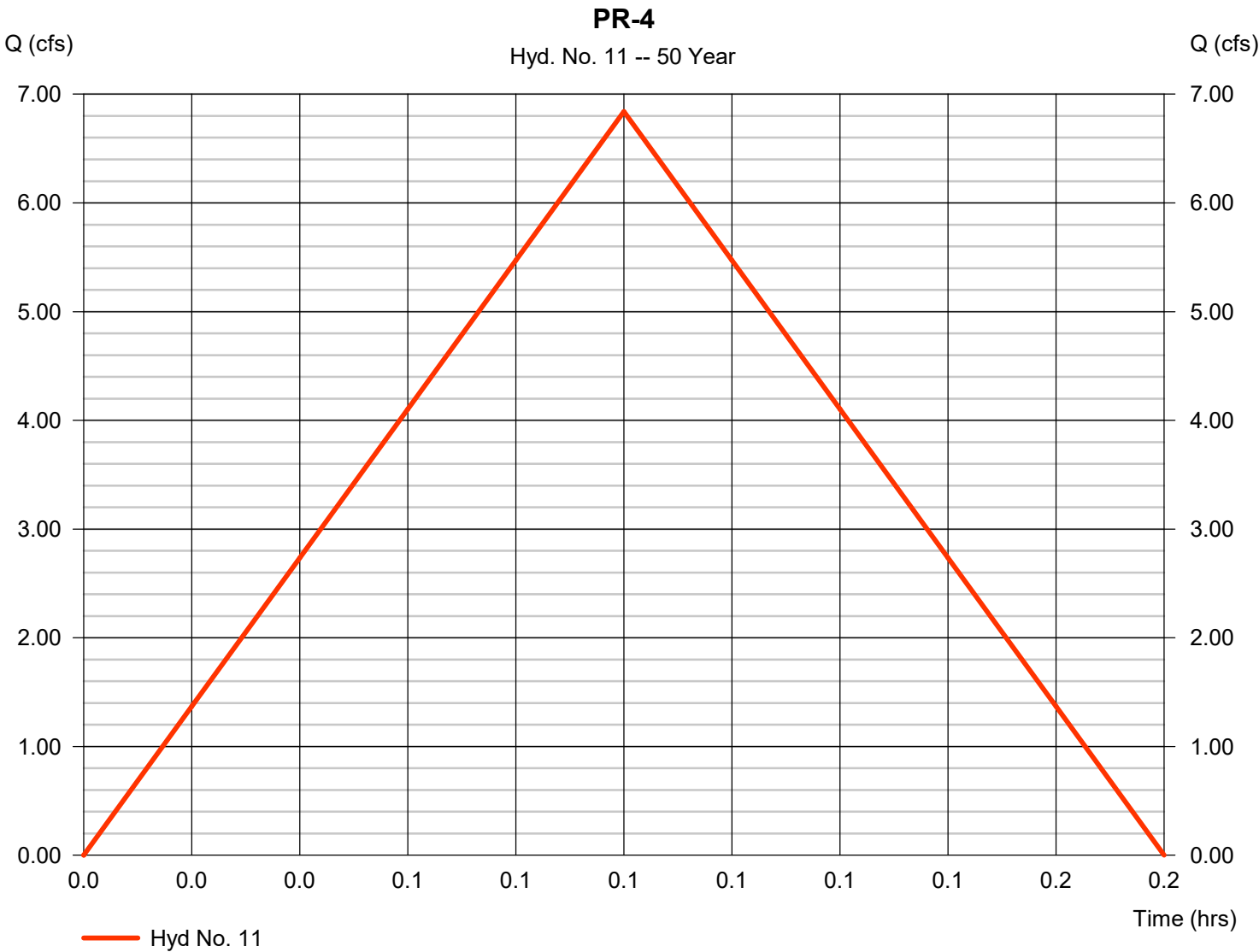


Hydrograph Report

Hyd. No. 11

PR-4

Hydrograph type	= Rational	Peak discharge	= 6.839 cfs
Storm frequency	= 50 yrs	Time to peak	= 0.08 hrs
Time interval	= 1 min	Hyd. volume	= 2,052 cuft
Drainage area	= 0.810 ac	Runoff coeff.	= 0.9
Intensity	= 9.382 in/hr	Tc by User	= 5.00 min
IDF Curve	= OKC, OK IDF.IDF	Asc/Rec limb fact	= 1/1

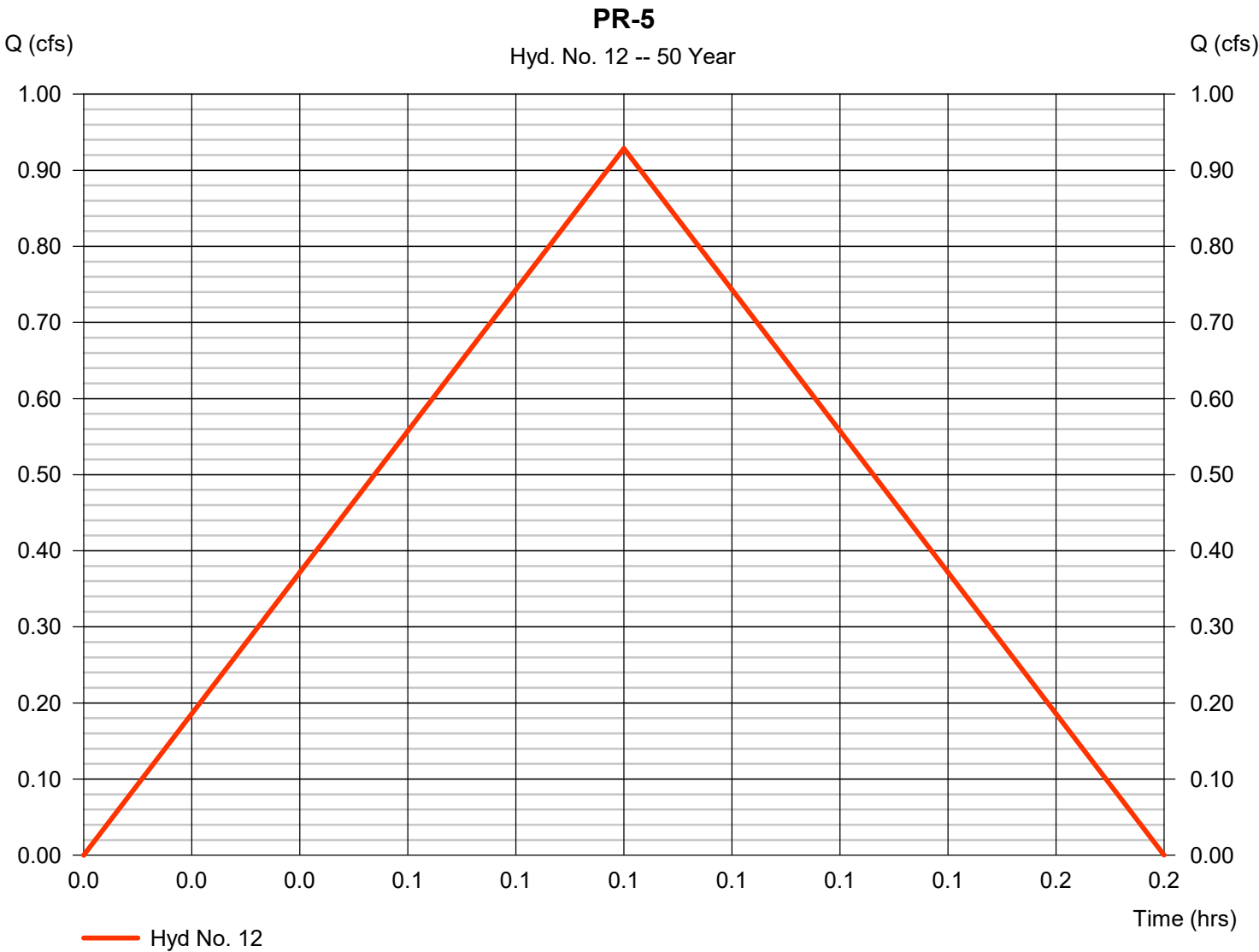


Hydrograph Report

Hyd. No. 12

PR-5

Hydrograph type	= Rational	Peak discharge	= 0.929 cfs
Storm frequency	= 50 yrs	Time to peak	= 0.08 hrs
Time interval	= 1 min	Hyd. volume	= 279 cuft
Drainage area	= 0.110 ac	Runoff coeff.	= 0.9
Intensity	= 9.382 in/hr	Tc by User	= 5.00 min
IDF Curve	= OKC, OK IDF.IDF	Asc/Rec limb fact	= 1/1

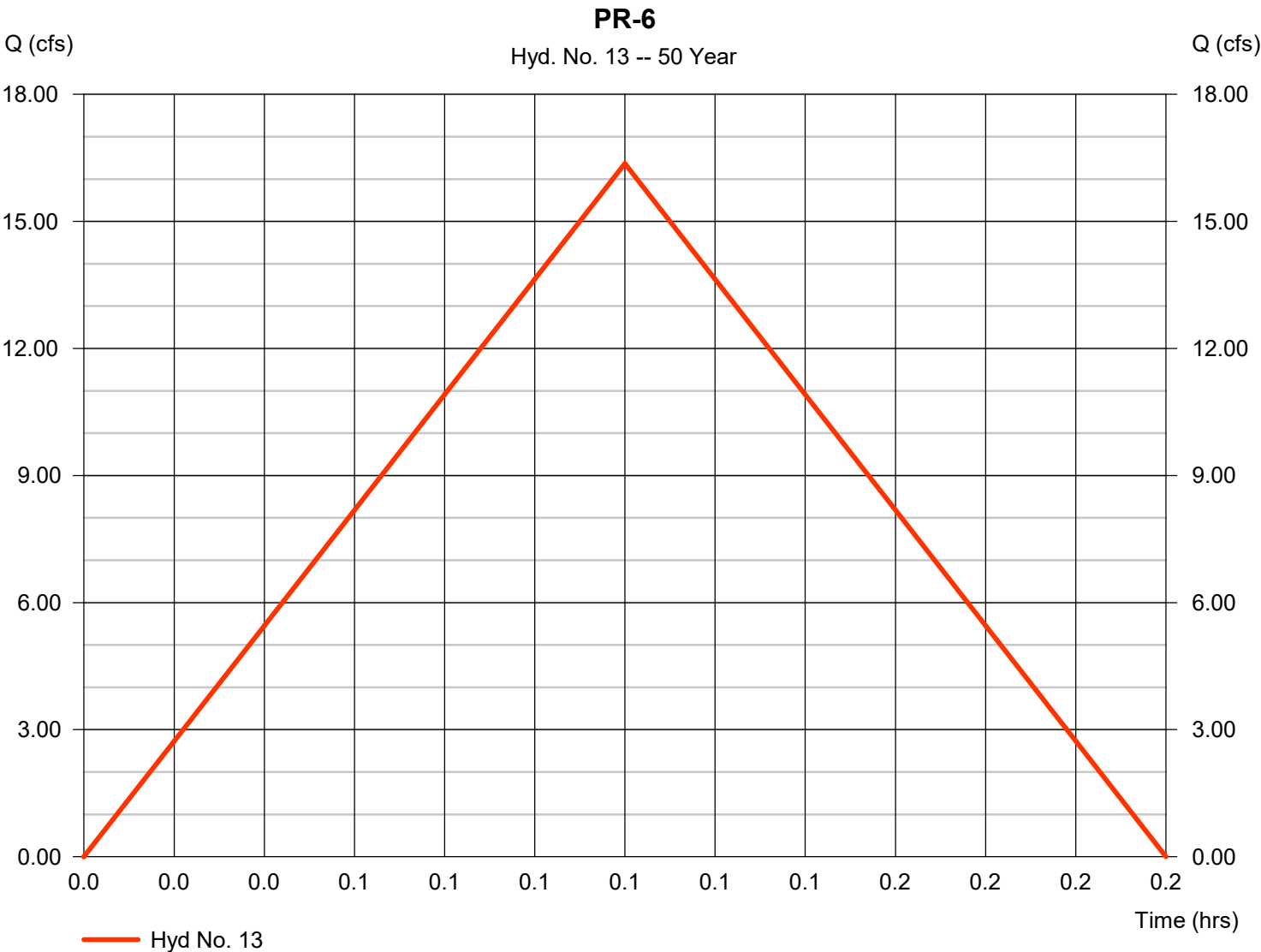


Hydrograph Report

Hyd. No. 13

PR-6

Hydrograph type	= Rational	Peak discharge	= 16.37 cfs
Storm frequency	= 50 yrs	Time to peak	= 0.10 hrs
Time interval	= 1 min	Hyd. volume	= 5,892 cuft
Drainage area	= 2.010 ac	Runoff coeff.	= 0.9
Intensity	= 9.048 in/hr	Tc by User	= 6.00 min
IDF Curve	= OKC, OK IDF.IDF	Asc/Rec limb fact	= 1/1

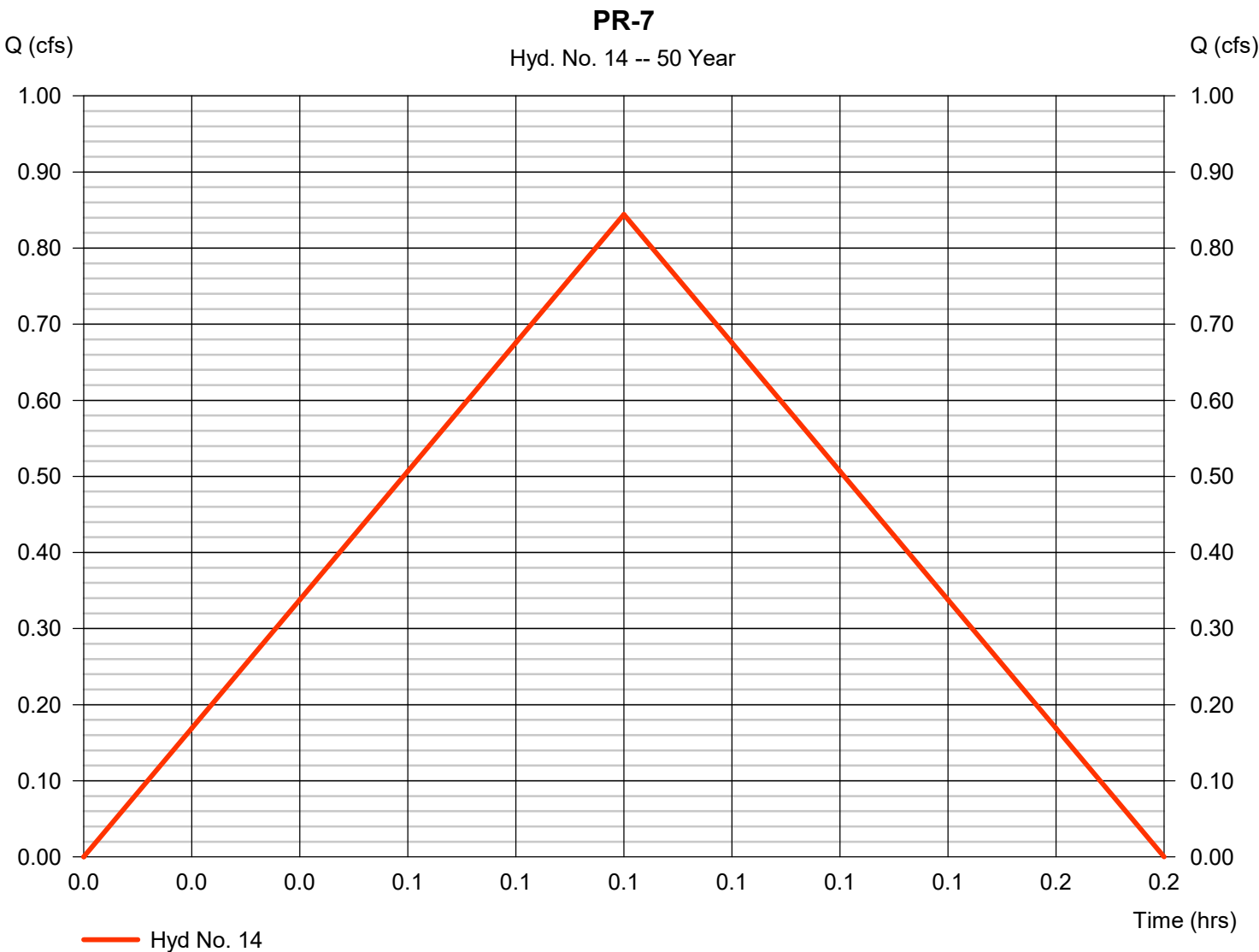


Hydrograph Report

Hyd. No. 14

PR-7

Hydrograph type	= Rational	Peak discharge	= 0.844 cfs
Storm frequency	= 50 yrs	Time to peak	= 0.08 hrs
Time interval	= 1 min	Hyd. volume	= 253 cuft
Drainage area	= 0.100 ac	Runoff coeff.	= 0.9
Intensity	= 9.382 in/hr	Tc by User	= 5.00 min
IDF Curve	= OKC, OK IDF.IDF	Asc/Rec limb fact	= 1/1

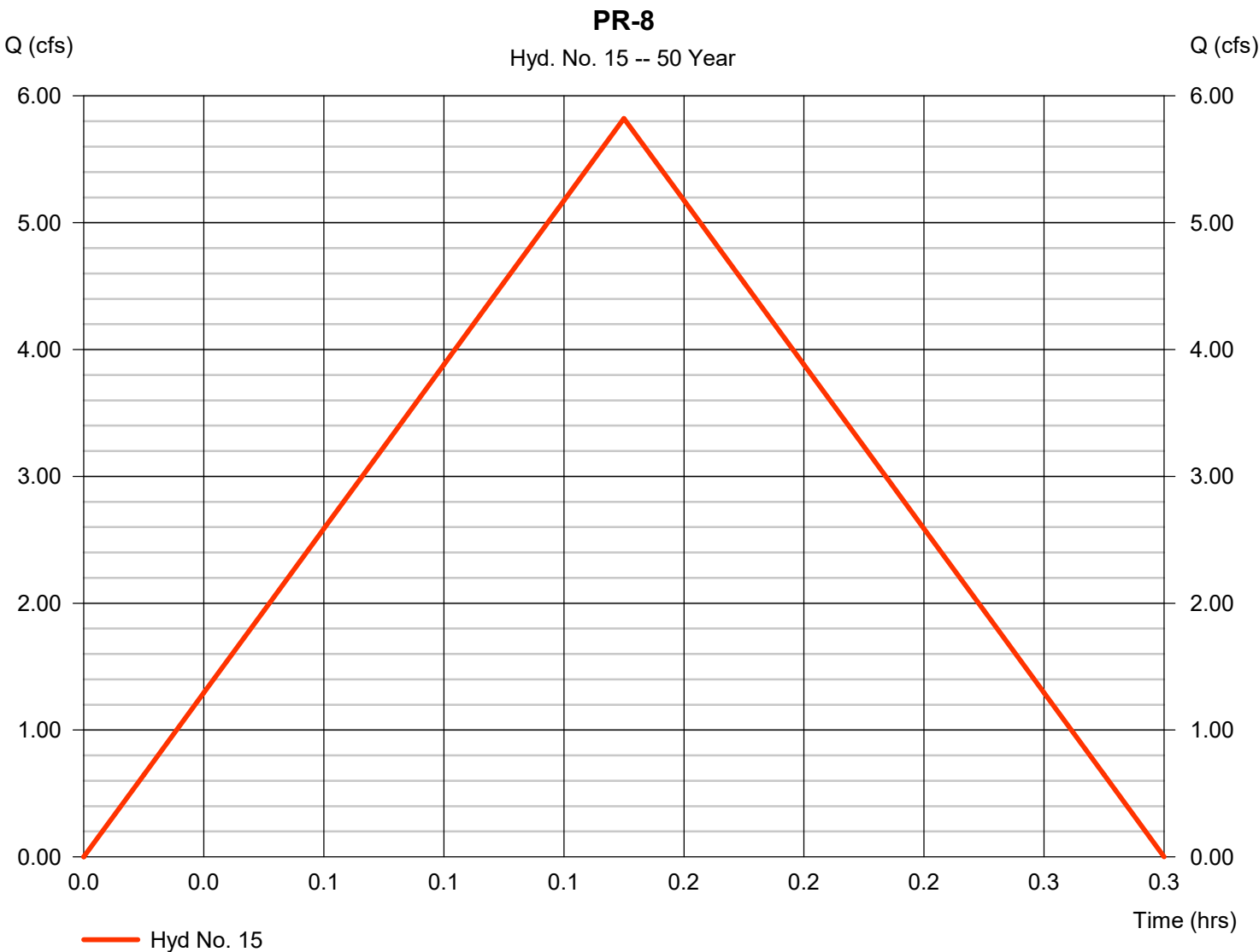


Hydrograph Report

Hyd. No. 15

PR-8

Hydrograph type	= Rational	Peak discharge	= 5.822 cfs
Storm frequency	= 50 yrs	Time to peak	= 0.15 hrs
Time interval	= 1 min	Hyd. volume	= 3,144 cuft
Drainage area	= 0.790 ac	Runoff coeff.	= 0.9
Intensity	= 8.189 in/hr	Tc by User	= 9.00 min
IDF Curve	= OKC, OK IDF.IDF	Asc/Rec limb fact	= 1/1

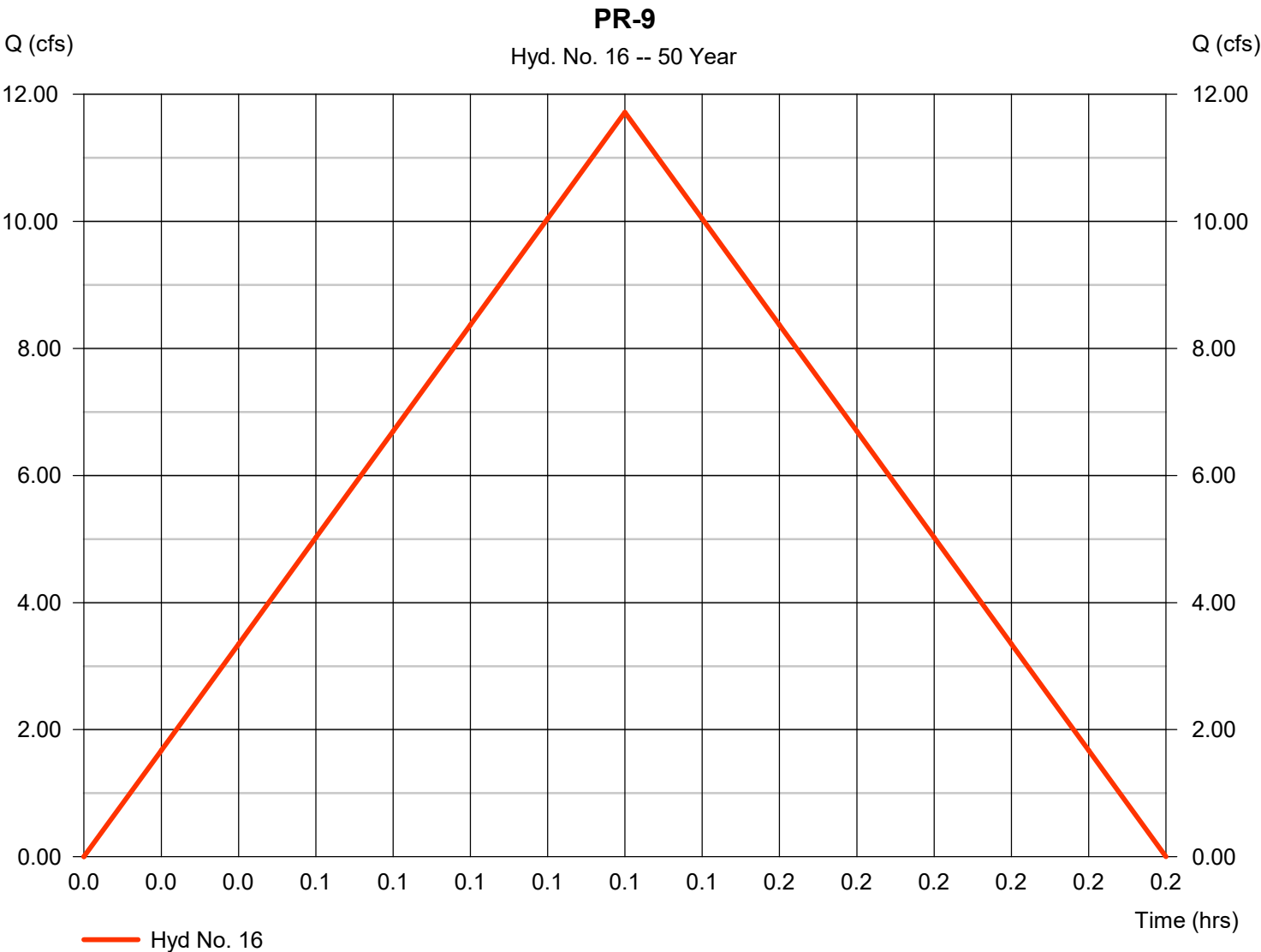


Hydrograph Report

Hyd. No. 16

PR-9

Hydrograph type	= Rational	Peak discharge	= 11.72 cfs
Storm frequency	= 50 yrs	Time to peak	= 0.12 hrs
Time interval	= 1 min	Hyd. volume	= 4,922 cuft
Drainage area	= 1.490 ac	Runoff coeff.	= 0.9
Intensity	= 8.739 in/hr	Tc by User	= 7.00 min
IDF Curve	= OKC, OK IDF.IDF	Asc/Rec limb fact	= 1/1



Hydrograph Summary Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2022

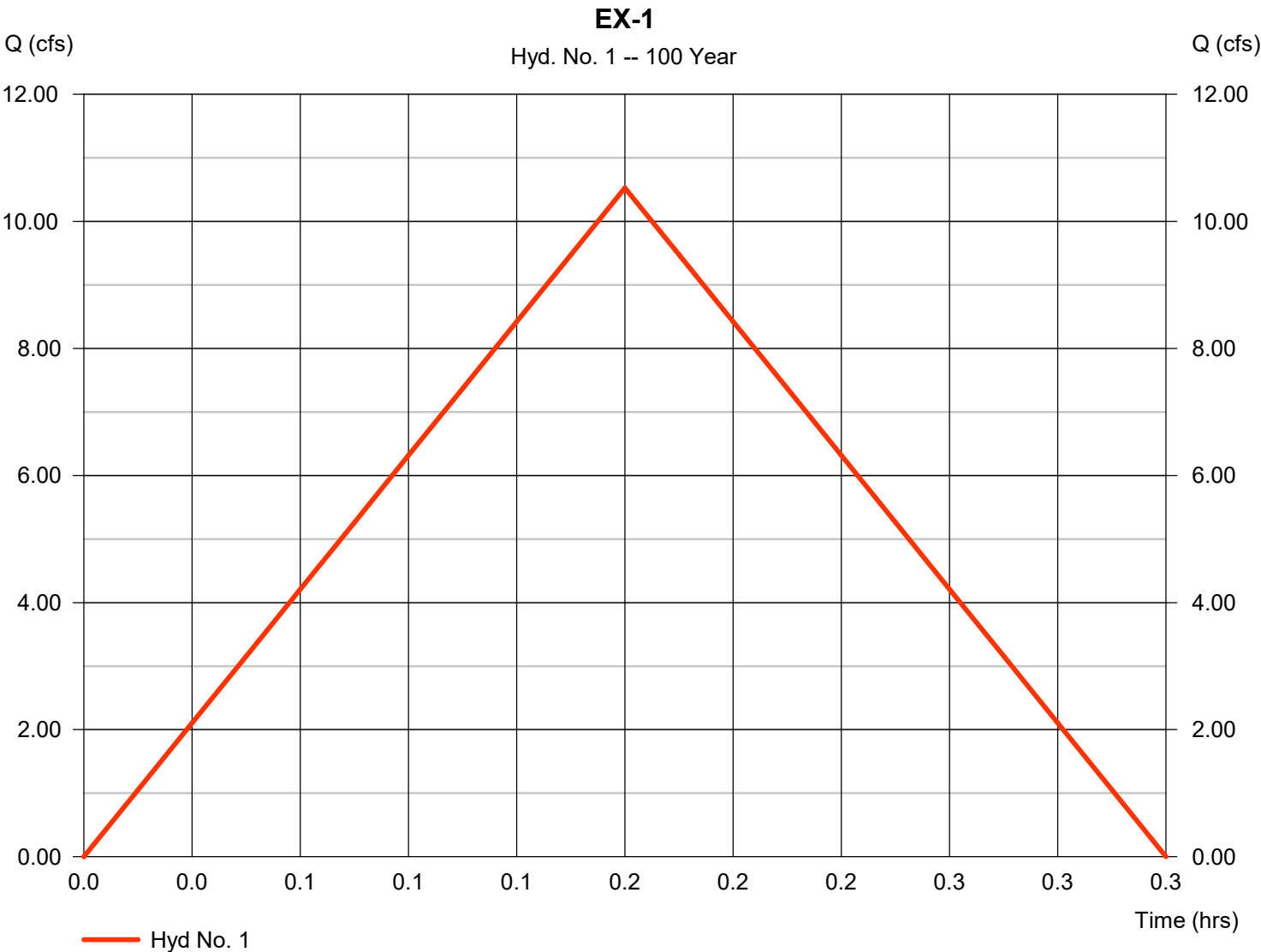
Hyd. No.	Hydrograph type (origin)	Peak flow (cfs)	Time interval (min)	Time to Peak (min)	Hyd. volume (cuft)	Inflow hyd(s)	Maximum elevation (ft)	Total strge used (cuft)	Hydrograph Description
1	Rational	10.53	1	10	6,316	-----	-----	-----	EX-1
2	Rational	24.37	1	8	11,699	-----	-----	-----	EX-2
3	Rational	9.903	1	10	5,942	-----	-----	-----	EX-3
4	Rational	19.70	1	7	8,273	-----	-----	-----	EX-4
5	Rational	1.010	1	5	303	-----	-----	-----	EX-5
6	Rational	17.81	1	6	6,412	-----	-----	-----	EX-6
7	Rational	0.918	1	5	275	-----	-----	-----	EX-7
8	Rational	10.53	1	10	6,316	-----	-----	-----	PR-1
9	Rational	24.37	1	8	11,699	-----	-----	-----	PR-2
10	Rational	4.253	1	6	1,531	-----	-----	-----	PR-3
11	Rational	7.437	1	5	2,231	-----	-----	-----	PR-4
12	Rational	1.010	1	5	303	-----	-----	-----	PR-5
13	Rational	17.81	1	6	6,412	-----	-----	-----	PR-6
14	Rational	0.918	1	5	275	-----	-----	-----	PR-7
15	Rational	6.348	1	9	3,428	-----	-----	-----	PR-8
16	Rational	12.76	1	7	5,360	-----	-----	-----	PR-9
Flows.gpw					Return Period: 100 Year			Friday, 02 / 11 / 2022	

Hydrograph Report

Hyd. No. 1

EX-1

Hydrograph type	= Rational	Peak discharge	= 10.53 cfs
Storm frequency	= 100 yrs	Time to peak	= 0.17 hrs
Time interval	= 1 min	Hyd. volume	= 6,316 cuft
Drainage area	= 1.350 ac	Runoff coeff.	= 0.9
Intensity	= 8.664 in/hr	Tc by User	= 10.00 min
IDF Curve	= OKC, OK IDF.IDF	Asc/Rec limb fact	= 1/1

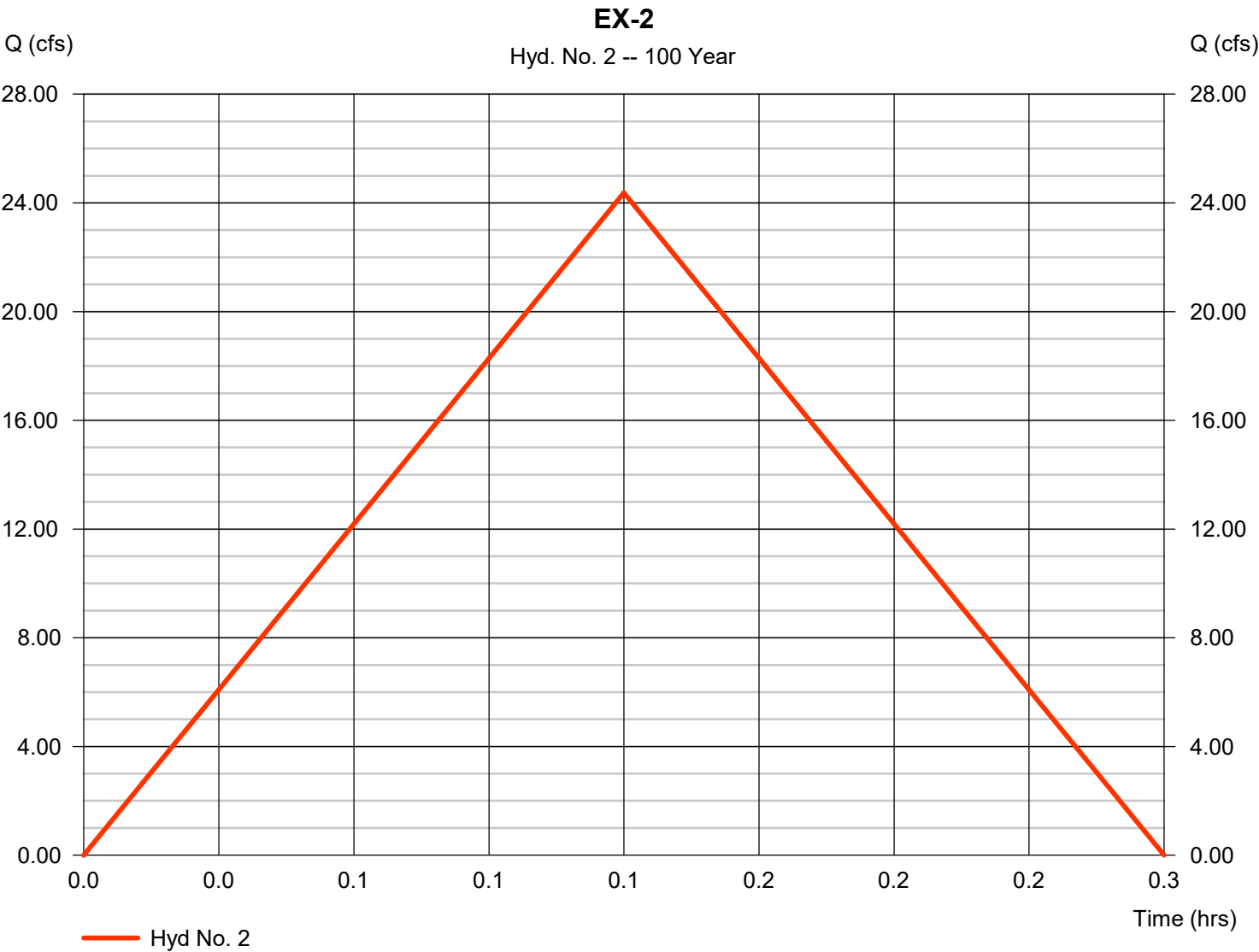


Hydrograph Report

Hyd. No. 2

EX-2

Hydrograph type	= Rational	Peak discharge	= 24.37 cfs
Storm frequency	= 100 yrs	Time to peak	= 0.13 hrs
Time interval	= 1 min	Hyd. volume	= 11,699 cuft
Drainage area	= 2.940 ac	Runoff coeff.	= 0.9
Intensity	= 9.211 in/hr	Tc by User	= 8.00 min
IDF Curve	= OKC, OK IDF.IDF	Asc/Rec limb fact	= 1/1

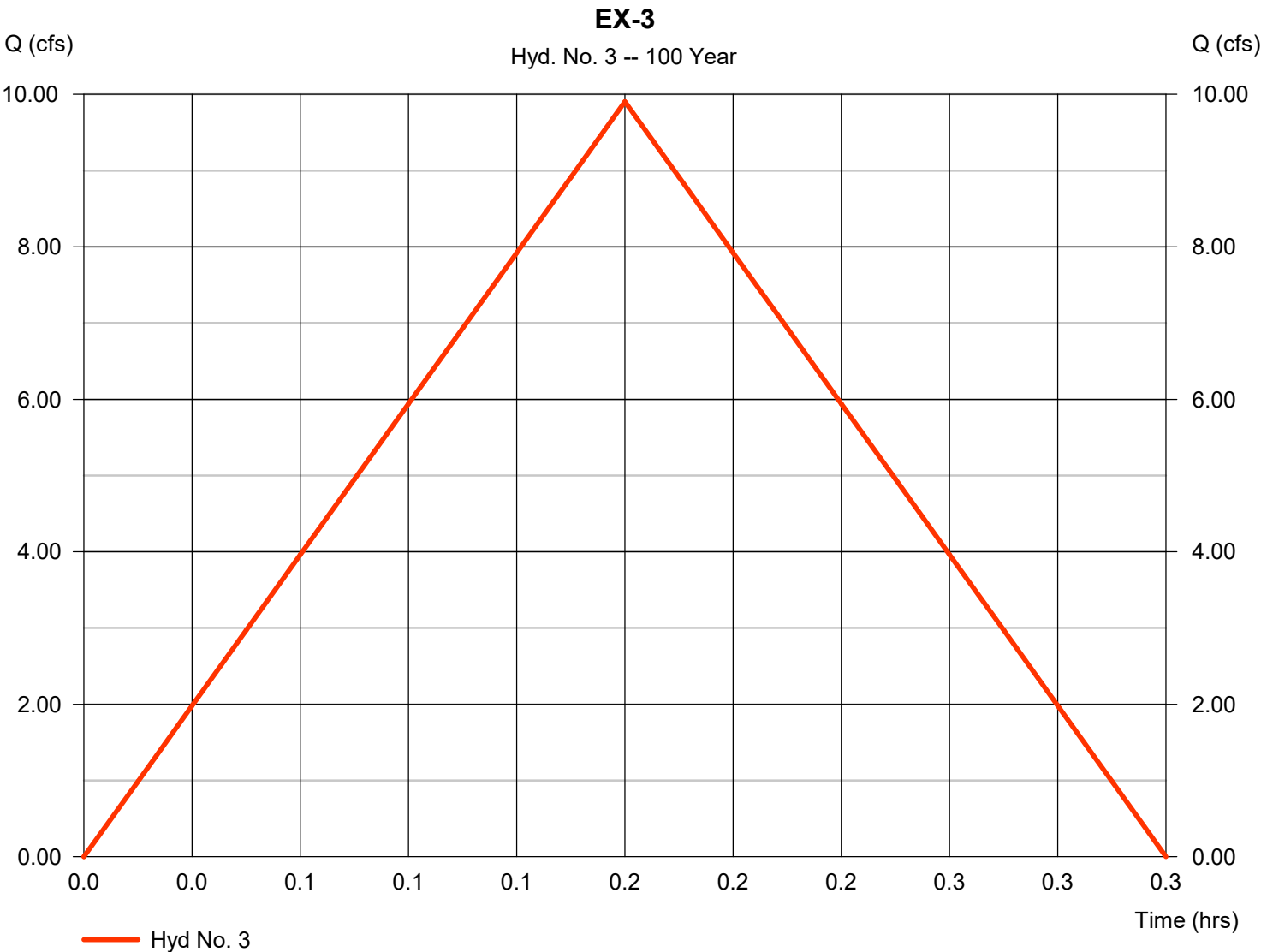


Hydrograph Report

Hyd. No. 3

EX-3

Hydrograph type	= Rational	Peak discharge	= 9.903 cfs
Storm frequency	= 100 yrs	Time to peak	= 0.17 hrs
Time interval	= 1 min	Hyd. volume	= 5,942 cuft
Drainage area	= 1.270 ac	Runoff coeff.	= 0.9
Intensity	= 8.664 in/hr	Tc by User	= 10.00 min
IDF Curve	= OKC, OK IDF.IDF	Asc/Rec limb fact	= 1/1

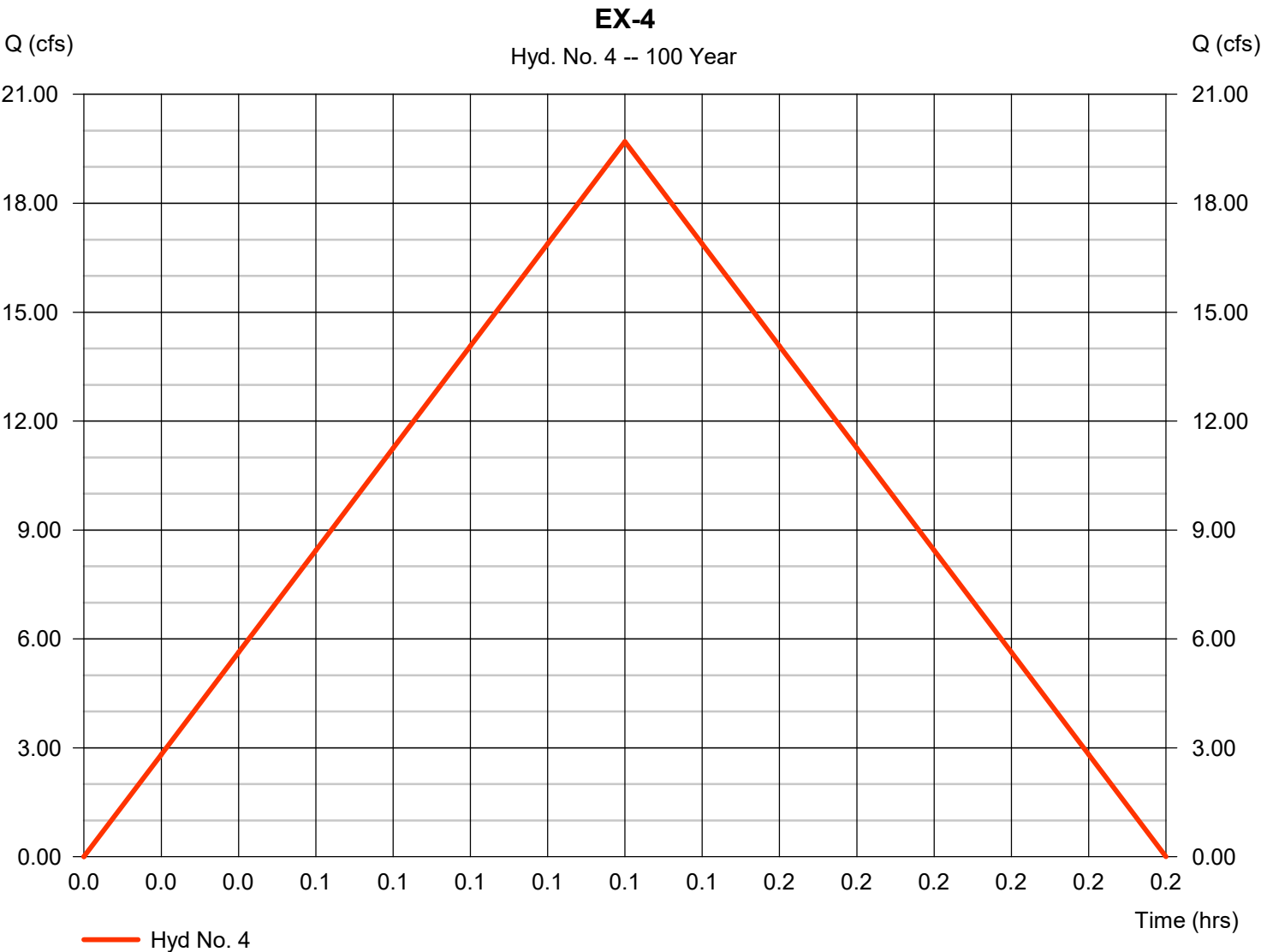


Hydrograph Report

Hyd. No. 4

EX-4

Hydrograph type	= Rational	Peak discharge	= 19.70 cfs
Storm frequency	= 100 yrs	Time to peak	= 0.12 hrs
Time interval	= 1 min	Hyd. volume	= 8,273 cuft
Drainage area	= 2.300 ac	Runoff coeff.	= 0.9
Intensity	= 9.516 in/hr	Tc by User	= 7.00 min
IDF Curve	= OKC, OK IDF.IDF	Asc/Rec limb fact	= 1/1

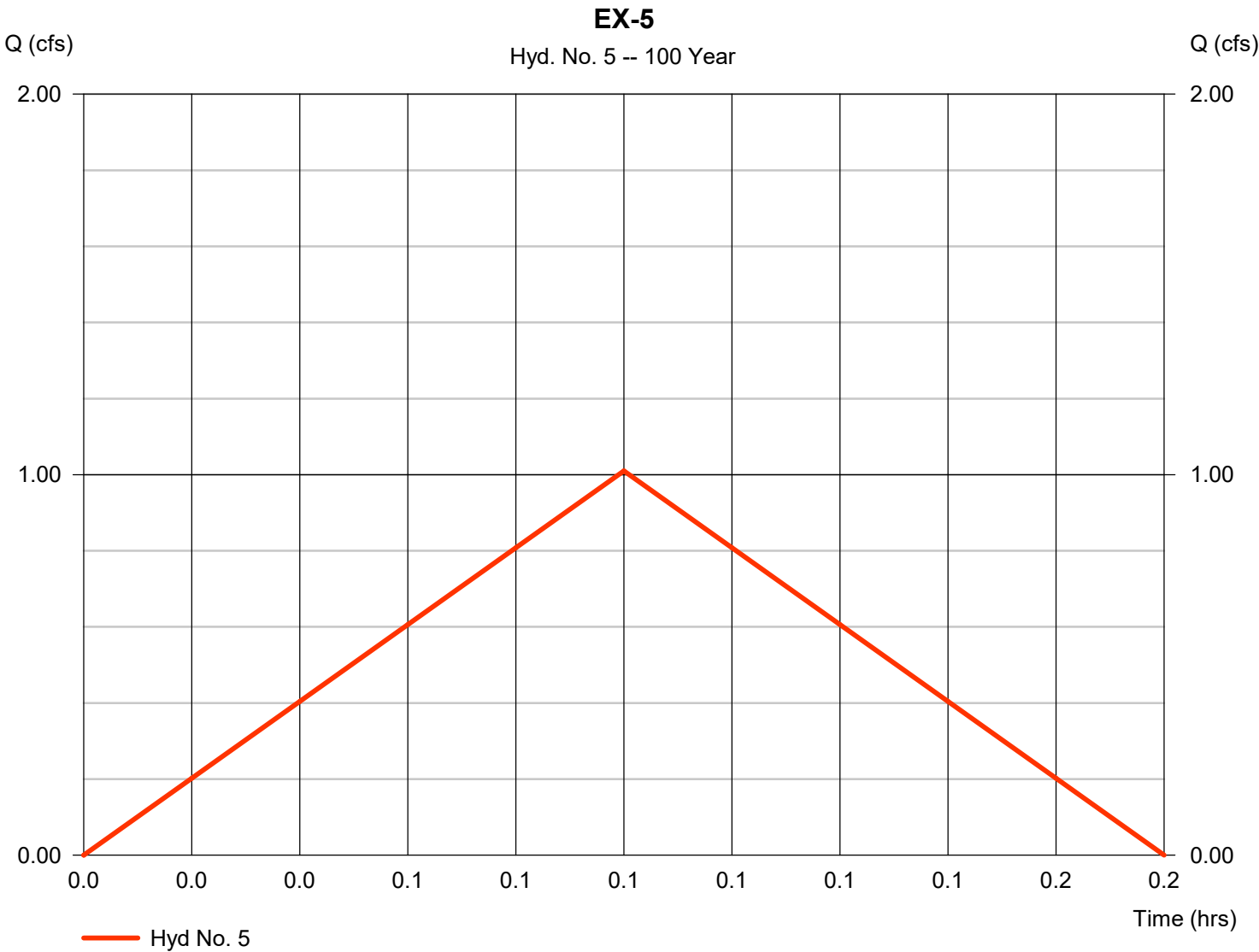


Hydrograph Report

Hyd. No. 5

EX-5

Hydrograph type	= Rational	Peak discharge	= 1.010 cfs
Storm frequency	= 100 yrs	Time to peak	= 0.08 hrs
Time interval	= 1 min	Hyd. volume	= 303 cuft
Drainage area	= 0.110 ac	Runoff coeff.	= 0.9
Intensity	= 10.202 in/hr	Tc by User	= 5.00 min
IDF Curve	= OKC, OK IDF.IDF	Asc/Rec limb fact	= 1/1

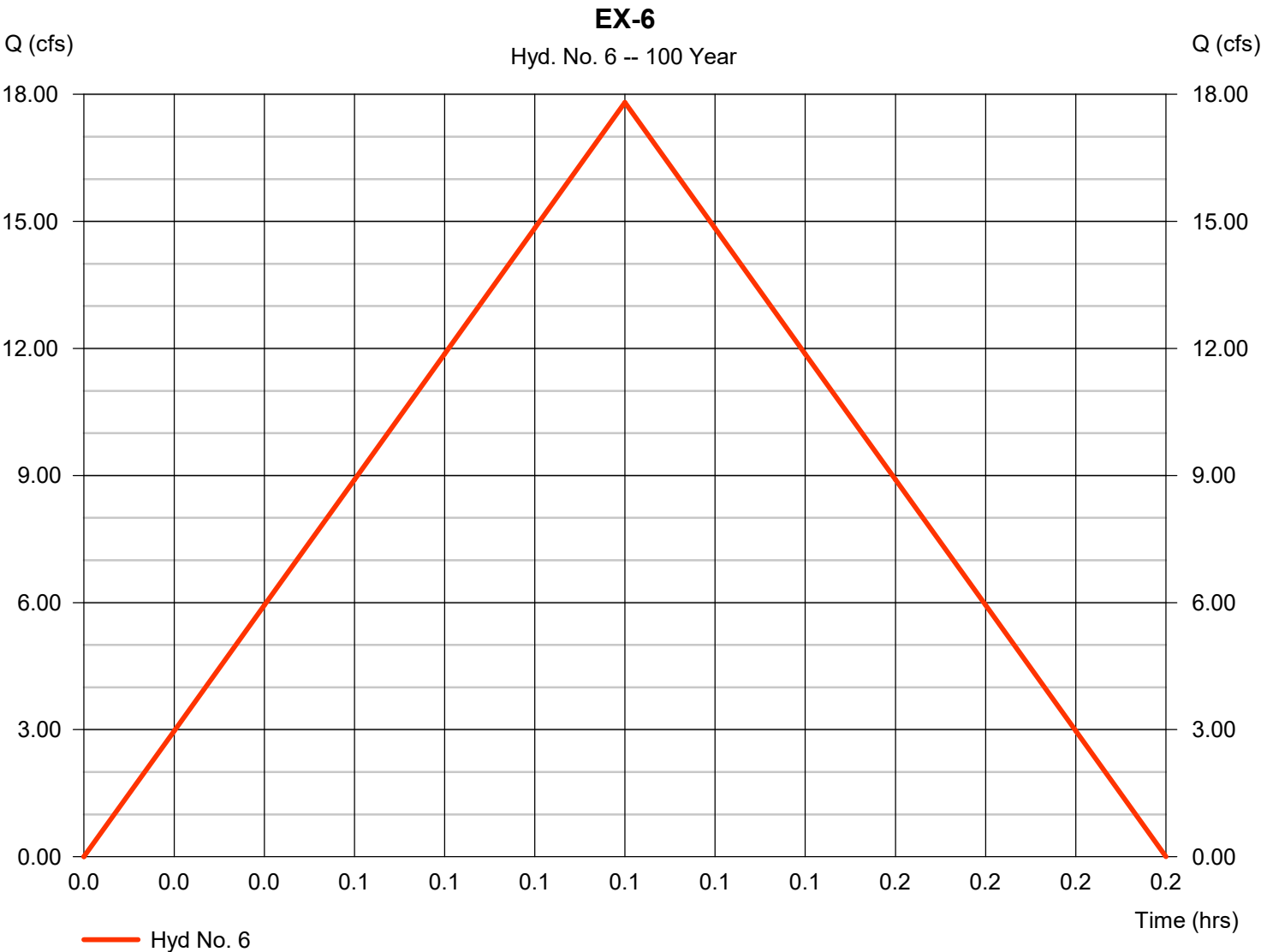


Hydrograph Report

Hyd. No. 6

EX-6

Hydrograph type	= Rational	Peak discharge	= 17.81 cfs
Storm frequency	= 100 yrs	Time to peak	= 0.10 hrs
Time interval	= 1 min	Hyd. volume	= 6,412 cuft
Drainage area	= 2.010 ac	Runoff coeff.	= 0.9
Intensity	= 9.845 in/hr	Tc by User	= 6.00 min
IDF Curve	= OKC, OK IDF.IDF	Asc/Rec limb fact	= 1/1

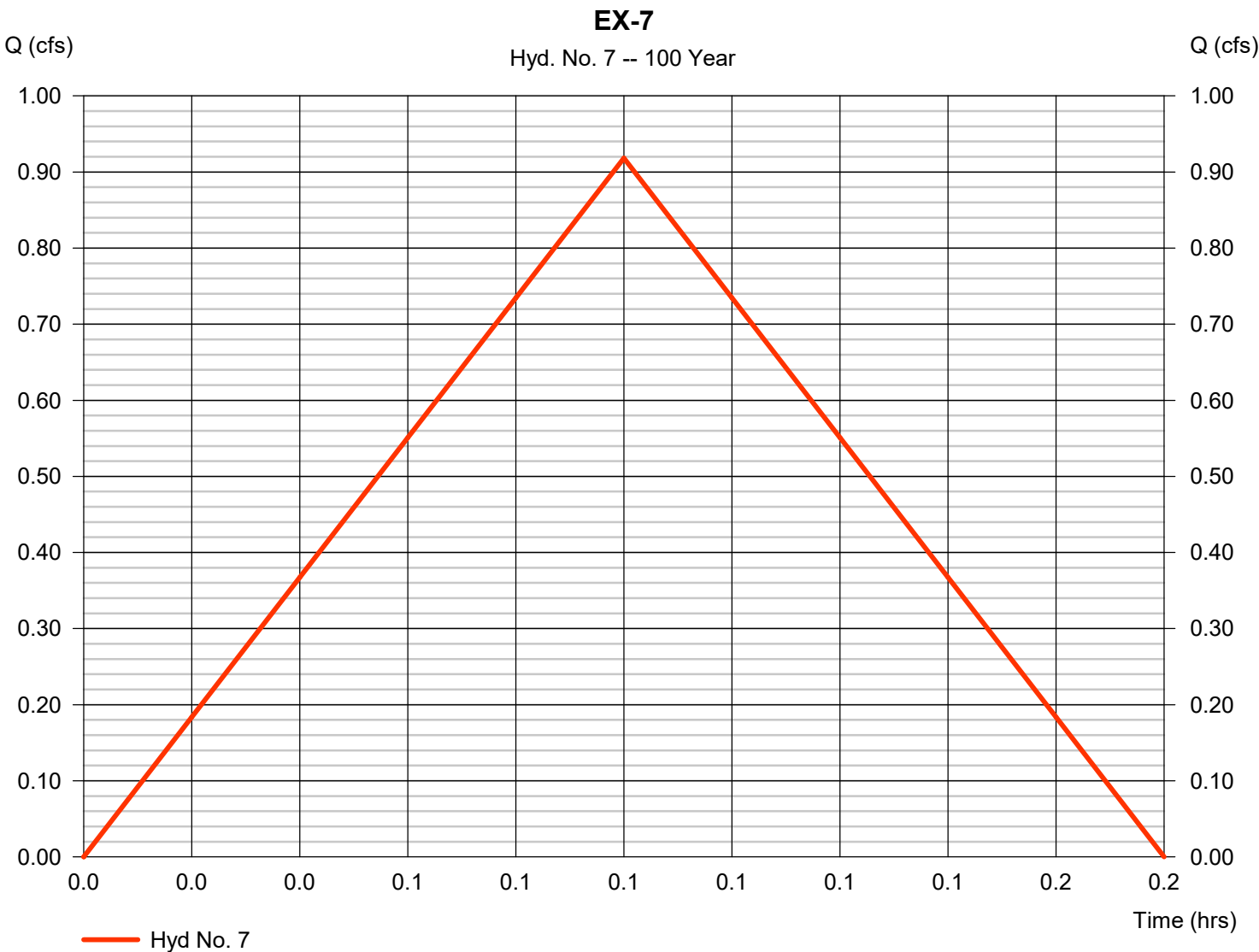


Hydrograph Report

Hyd. No. 7

EX-7

Hydrograph type	= Rational	Peak discharge	= 0.918 cfs
Storm frequency	= 100 yrs	Time to peak	= 0.08 hrs
Time interval	= 1 min	Hyd. volume	= 275 cuft
Drainage area	= 0.100 ac	Runoff coeff.	= 0.9
Intensity	= 10.202 in/hr	Tc by User	= 5.00 min
IDF Curve	= OKC, OK IDF.IDF	Asc/Rec limb fact	= 1/1

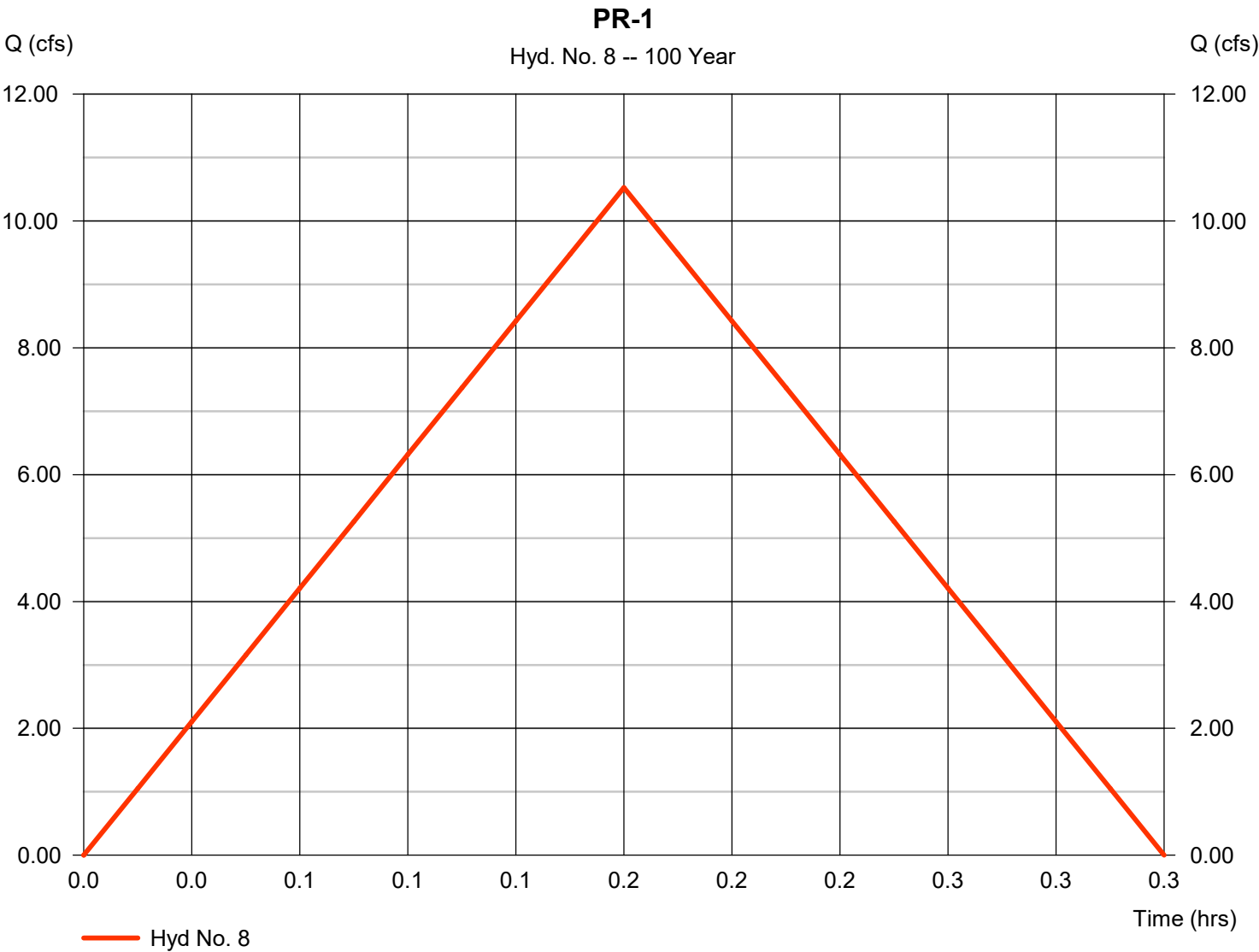


Hydrograph Report

Hyd. No. 8

PR-1

Hydrograph type	= Rational	Peak discharge	= 10.53 cfs
Storm frequency	= 100 yrs	Time to peak	= 0.17 hrs
Time interval	= 1 min	Hyd. volume	= 6,316 cuft
Drainage area	= 1.350 ac	Runoff coeff.	= 0.9
Intensity	= 8.664 in/hr	Tc by User	= 10.00 min
IDF Curve	= OKC, OK IDF.IDF	Asc/Rec limb fact	= 1/1

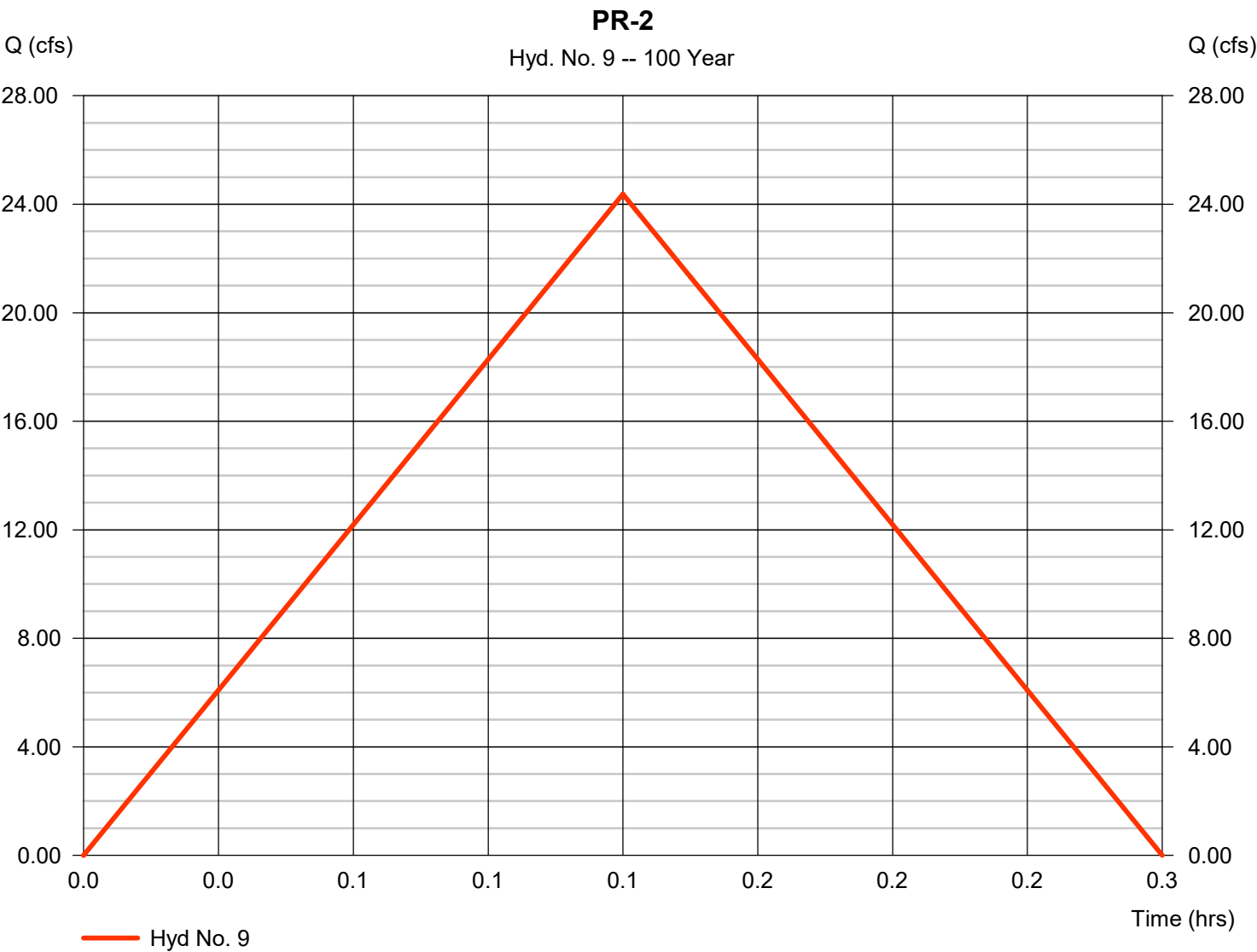


Hydrograph Report

Hyd. No. 9

PR-2

Hydrograph type	= Rational	Peak discharge	= 24.37 cfs
Storm frequency	= 100 yrs	Time to peak	= 0.13 hrs
Time interval	= 1 min	Hyd. volume	= 11,699 cuft
Drainage area	= 2.940 ac	Runoff coeff.	= 0.9
Intensity	= 9.211 in/hr	Tc by User	= 8.00 min
IDF Curve	= OKC, OK IDF.IDF	Asc/Rec limb fact	= 1/1

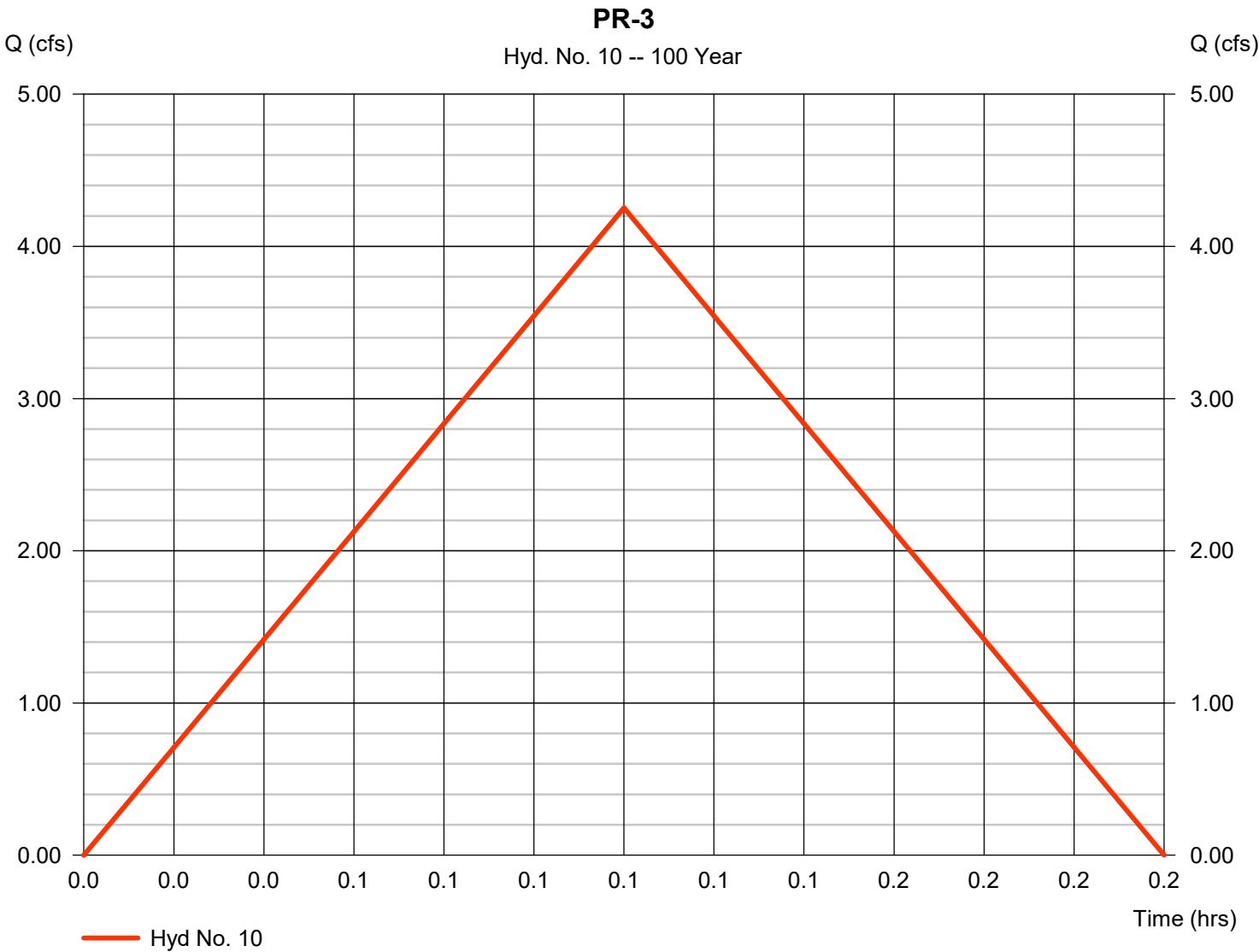


Hydrograph Report

Hyd. No. 10

PR-3

Hydrograph type	= Rational	Peak discharge	= 4.253 cfs
Storm frequency	= 100 yrs	Time to peak	= 0.10 hrs
Time interval	= 1 min	Hyd. volume	= 1,531 cuft
Drainage area	= 0.480 ac	Runoff coeff.	= 0.9
Intensity	= 9.845 in/hr	Tc by User	= 6.00 min
IDF Curve	= OKC, OK IDF.IDF	Asc/Rec limb fact	= 1/1

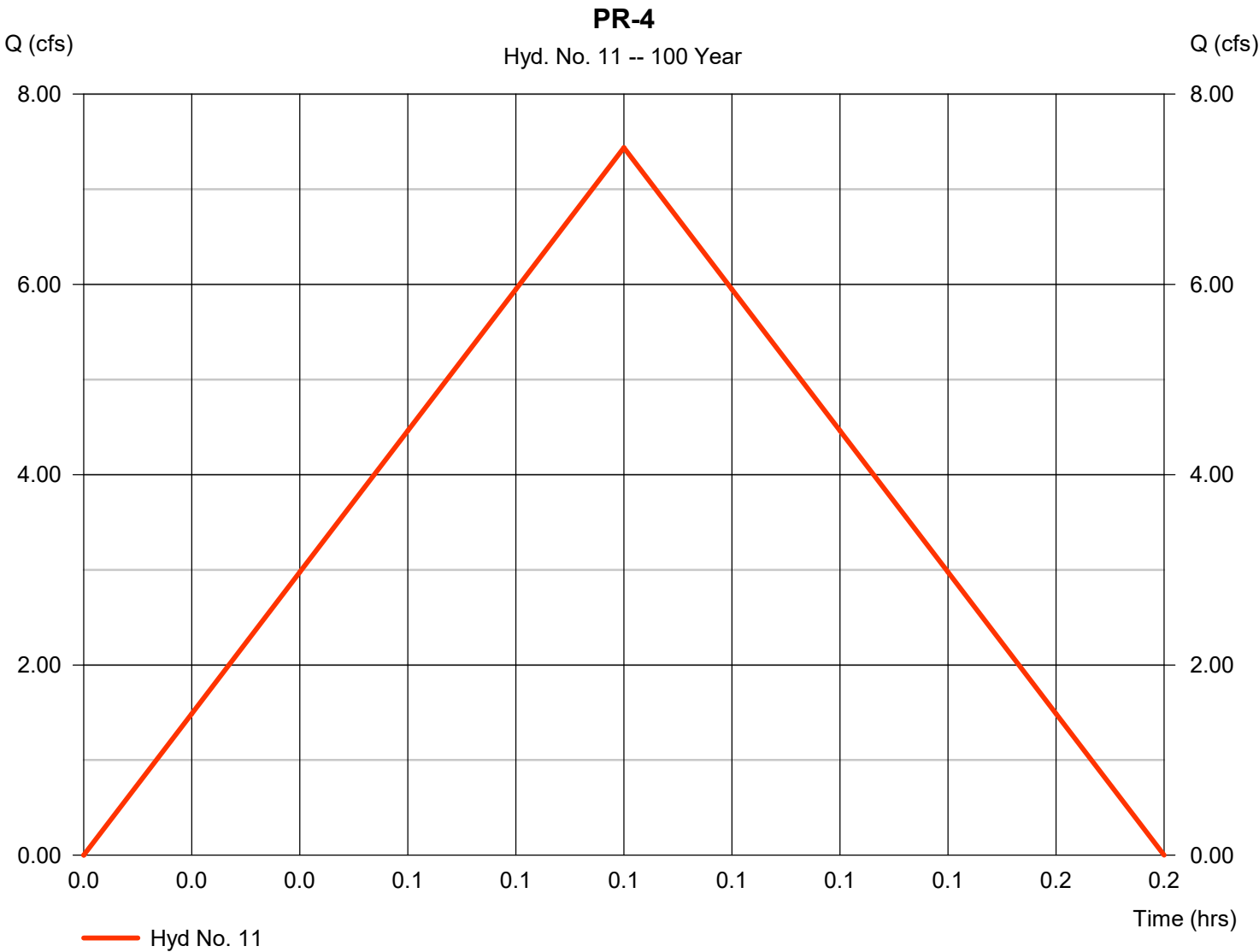


Hydrograph Report

Hyd. No. 11

PR-4

Hydrograph type	= Rational	Peak discharge	= 7.437 cfs
Storm frequency	= 100 yrs	Time to peak	= 0.08 hrs
Time interval	= 1 min	Hyd. volume	= 2,231 cuft
Drainage area	= 0.810 ac	Runoff coeff.	= 0.9
Intensity	= 10.202 in/hr	Tc by User	= 5.00 min
IDF Curve	= OKC, OK IDF.IDF	Asc/Rec limb fact	= 1/1

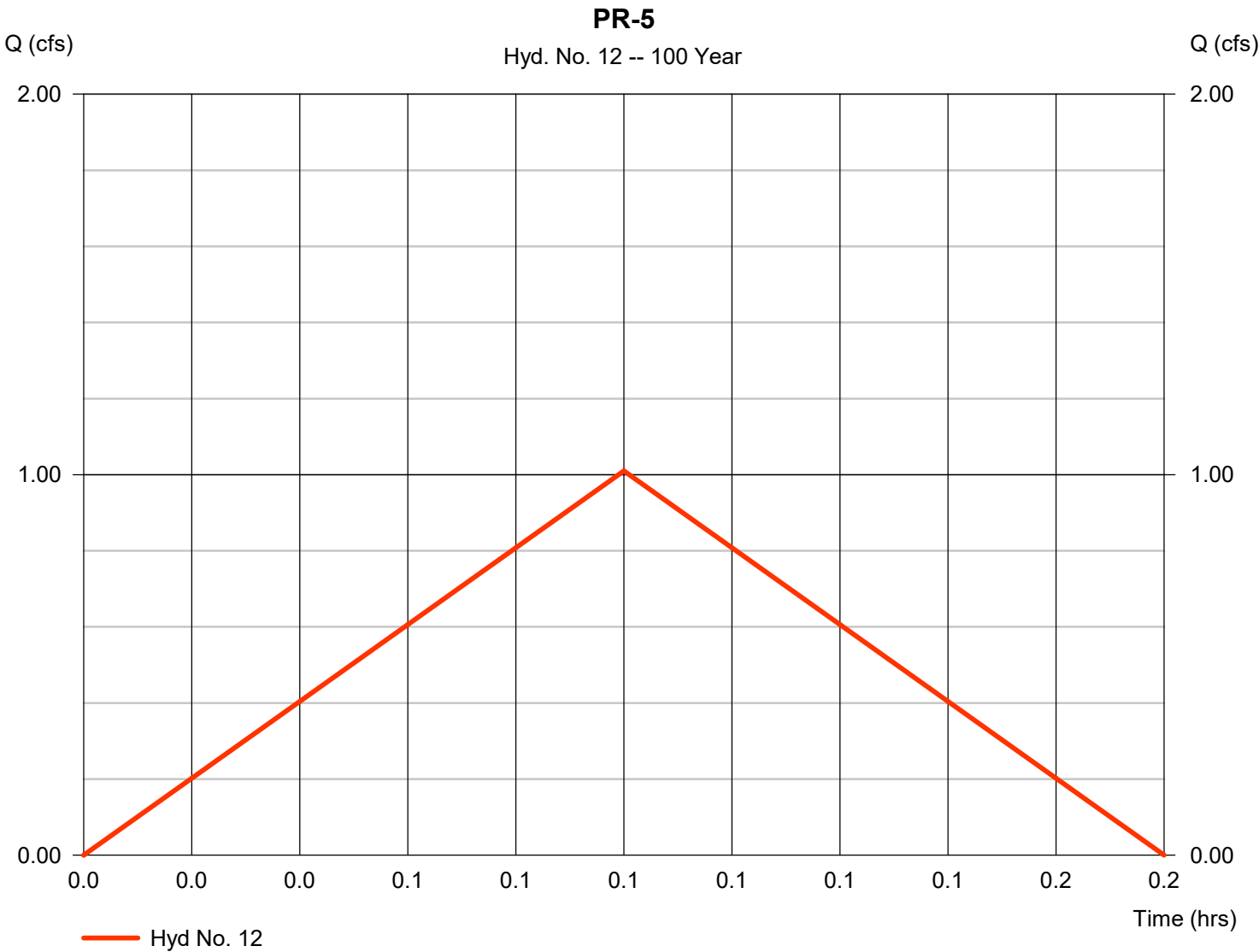


Hydrograph Report

Hyd. No. 12

PR-5

Hydrograph type	= Rational	Peak discharge	= 1.010 cfs
Storm frequency	= 100 yrs	Time to peak	= 0.08 hrs
Time interval	= 1 min	Hyd. volume	= 303 cuft
Drainage area	= 0.110 ac	Runoff coeff.	= 0.9
Intensity	= 10.202 in/hr	Tc by User	= 5.00 min
IDF Curve	= OKC, OK IDF.IDF	Asc/Rec limb fact	= 1/1

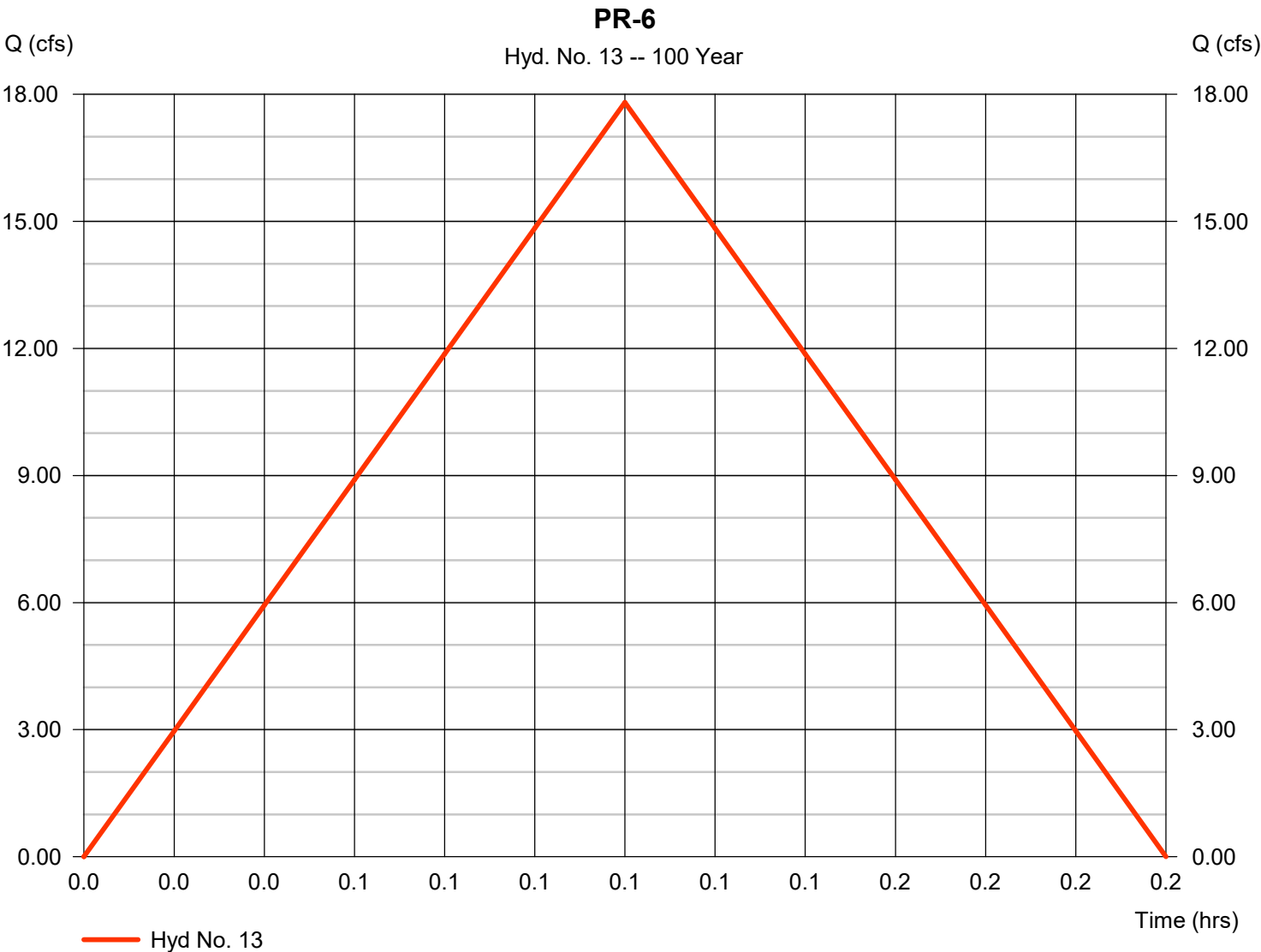


Hydrograph Report

Hyd. No. 13

PR-6

Hydrograph type	= Rational	Peak discharge	= 17.81 cfs
Storm frequency	= 100 yrs	Time to peak	= 0.10 hrs
Time interval	= 1 min	Hyd. volume	= 6,412 cuft
Drainage area	= 2.010 ac	Runoff coeff.	= 0.9
Intensity	= 9.845 in/hr	Tc by User	= 6.00 min
IDF Curve	= OKC, OK IDF.IDF	Asc/Rec limb fact	= 1/1

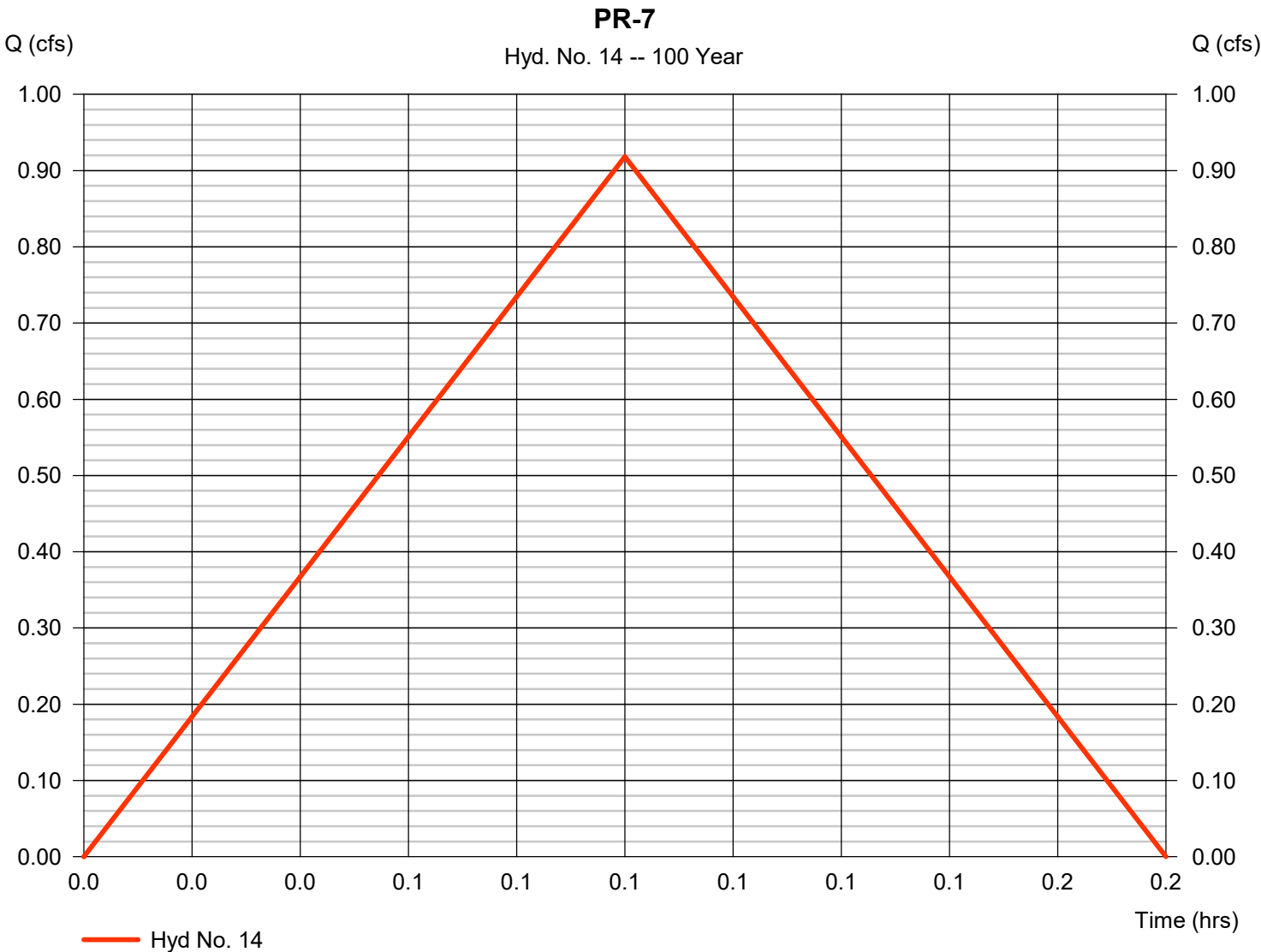


Hydrograph Report

Hyd. No. 14

PR-7

Hydrograph type	= Rational	Peak discharge	= 0.918 cfs
Storm frequency	= 100 yrs	Time to peak	= 0.08 hrs
Time interval	= 1 min	Hyd. volume	= 275 cuft
Drainage area	= 0.100 ac	Runoff coeff.	= 0.9
Intensity	= 10.202 in/hr	Tc by User	= 5.00 min
IDF Curve	= OKC, OK IDF.IDF	Asc/Rec limb fact	= 1/1

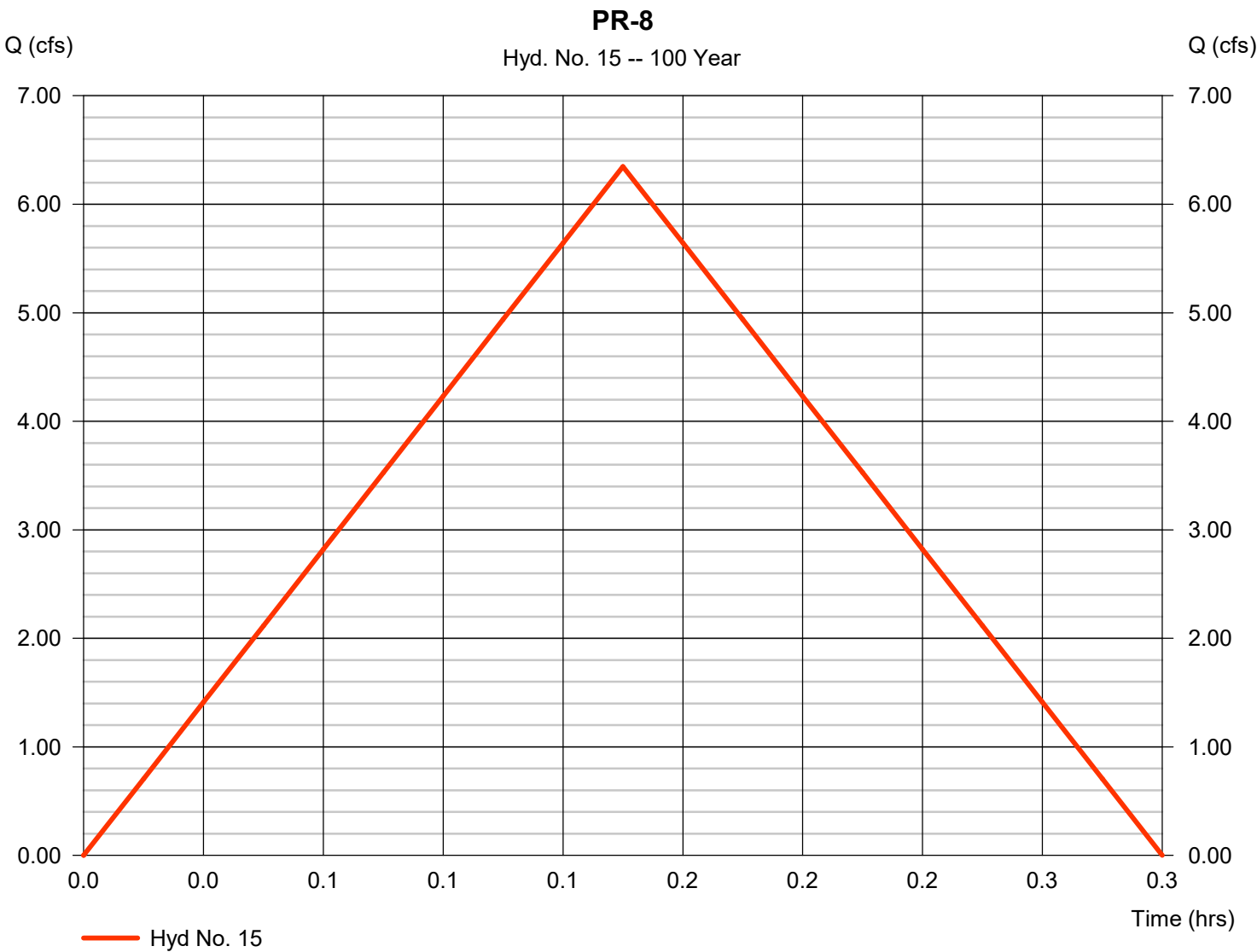


Hydrograph Report

Hyd. No. 15

PR-8

Hydrograph type	= Rational	Peak discharge	= 6.348 cfs
Storm frequency	= 100 yrs	Time to peak	= 0.15 hrs
Time interval	= 1 min	Hyd. volume	= 3,428 cuft
Drainage area	= 0.790 ac	Runoff coeff.	= 0.9
Intensity	= 8.928 in/hr	Tc by User	= 9.00 min
IDF Curve	= OKC, OK IDF.IDF	Asc/Rec limb fact	= 1/1



Hydrograph Report

Hyd. No. 16

PR-9

Hydrograph type	= Rational	Peak discharge	= 12.76 cfs
Storm frequency	= 100 yrs	Time to peak	= 0.12 hrs
Time interval	= 1 min	Hyd. volume	= 5,360 cuft
Drainage area	= 1.490 ac	Runoff coeff.	= 0.9
Intensity	= 9.516 in/hr	Tc by User	= 7.00 min
IDF Curve	= OKC, OK IDF.IDF	Asc/Rec limb fact	= 1/1

