

Section 100

General Provisions

101 TITLE

These criteria and design standards with all future amendments and revisions shall be known as the "CLARK COUNTY REGIONAL FLOOD CONTROL DISTRICT - HYDROLOGIC CRITERIA AND DRAINAGE DESIGN MANUAL" (herein referred to as the MANUAL). This MANUAL is part of the "Uniform Regulations for the Control of Drainage" (herein referred to as the REGULATIONS) as adopted by the Board of Directors (herein referred to as the BOARD) for the Clark County Regional Flood Control District (herein referred to as CCRFCD).

102 ADOPTION AUTHORITY

The CCRFCD is organized under Chapter 543 of the Nevada Revised Statutes (NRS). The CCRFCD BOARD (NRS 543.320) has adopted REGULATIONS as mandated in NRS 543.595(1) as well as a "Policies and Procedures Manual" (herein referred to as POLICIES AND PROCEDURES) as mandated in NRS 543.340(4).

Chapter 15.0 of the POLICIES AND PROCEDURES states that a "Hydrologic and Design Criteria Manual" will be developed by the CCRFCD. This chapter also states that the MANUAL shall be used for the development and design of all Flood Control Facilities located within the CCRFCD.

The CCRFCD has complied with the provisions of Chapter 15.0 by preparation of this MANUAL and has afforded all entities governed by the REGULATIONS the opportunity to participate in the development of the MANUAL.

This BOARD has enabled this MANUAL by adoption pursuant to Section 1.010(B) of the REGULATIONS.

103 JURISDICTION

These criteria and design standards shall apply to all areas within the boundaries of Clark County (NRS 543.240(1)).

104 PURPOSE

The purpose of the MANUAL is to provide a minimum standard for analysis and design of storm drainage facilities within the CCRFCD. Provision of the minimum standard assures that all drainage facilities are consistent in design and construction, and provides an integrated system which acts to protect the public health, safety, comfort, convenience, welfare, property and commerce.

105 ENFORCEMENT RESPONSIBILITY

Each entity is charged with enforcement of the MANUAL within its jurisdictional boundaries for Local and Regional Flood Control Facilities. Section 1600, Local Entity Criteria, contains the agency's addenda where more restrictive requirements are detailed. In addition to the entity's responsibility, the CCRFCD is also charged with enforcement of the MANUAL for all Regional Flood Control Facilities.

106 VARIANCE PROCEDURES

Variances to this MANUAL may only be requested for the following reasons:

1. Unusual situations where strict compliance with the MANUAL may not act to protect the public health and safety.
2. Unusual situations which require additional analysis outside the scope of this MANUAL for which the additional analysis shows that strict compliance with the MANUAL may not act to protect the public health and safety.
3. Unusual hydrologic and/or hydraulic conditions which cannot be adequately addressed by strict compliance with the MANUAL.

Conditions which are created by improper site planning (i.e., lack of adequate space allocations) shall not be considered as grounds for a variance request.

If the subdivider (developer, builder, etc.) believes that a variance to the minimum standards in this MANUAL is warranted based on the reasons listed above they shall request a variance from the minimum standards.

Variances from this MANUAL for all Regional Flood Control Facilities shall be made in accordance with Section 13 of the REGULATIONS. Variances from this MANUAL for all Local Flood Control Facilities shall be made in accordance with the local governing entity's variance procedure under which the REGULATIONS and this MANUAL are adopted.

107 INTERPRETATION

In the interpretation and application of the provisions of this MANUAL, the following shall govern:

1. The provisions shall be regarded as the minimum requirements for the protection of the public health, safety, comfort, convenience, welfare, property, and commerce of the residents of CCRFCD. This MANUAL shall

therefore be regarded as remedial and shall be liberally construed to further its underlying purposes.

2. Whenever a provision of this MANUAL and any other provisions of the REGULATIONS or any provisions in any law, ordinance, resolution, rule, or regulation of any kind, contain any restrictions covering any of the same subject matter, whichever restrictions are more restrictive or impose higher standards of requirements shall govern.

108 REVIEW AND APPROVAL

All drainage plans, reports, construction drawings and specifications shall be reviewed in accordance with the provisions of this MANUAL. This review and approval shall not relieve the owner, engineer, or designer from responsibility of ensuring that the calculations, plans, specifications, and construction drawings are in compliance with the provisions of this MANUAL.

The owner, developer, engineer, and designer must also understand that the local entities and CCRFCD do not and will not assume liability for the drainage facilities designed and/or certified by the engineer. In addition, the local entities and CCRFCD cannot guarantee that drainage design review and approval will absolve the owner, developer, engineer, designer, and/or their successors and/or assigns of future liability for improper design.

109 IMPLEMENTATION

109.1 Development of the MANUAL

The CCRFCD has developed this comprehensive MANUAL for use by the entities, and by consulting engineers. This MANUAL shall be used for the development and design of all Master Plan Flood Control Facilities and any other facilities dedicated to a public entity for ownership and maintenance.

Respective entities have been afforded the opportunity to participate in the development of this MANUAL and will be given the opportunity to participate in subsequent updates.

109.2 Updates

The MANUAL will be updated from time to time as determined by the Chief Engineer.

109.3 Adoption

The BOARD of the CCRFCD should adopt the MANUAL and all subsequent updates thereto. The entities should also adopt the MANUAL and all subsequent updates thereto.

109.4 Reconciliation of Pre- and Post-MANUAL Studies

1. Developments for which final detailed drainage reports (i.e., additional reports or analysis are not required prior to construction) or construction drawings have been approved are exempt from the provisions of this MANUAL and/or subsequent revisions. An exception to this exemption are Local Master Planned Facilities which are addressed in 109.4 (4).
2. Developments for which a preliminary drainage analysis (i.e., additional analysis or reports are required prior to construction) has been approved are exempt from the provisions of this MANUAL if a final drainage report and/or analysis is submitted for review within 180 days of the initial adoption of this MANUAL and/or subsequent revisions.
3. Developments for which drainage reports and/or analysis have not been submitted by the time of the initial adoption of this MANUAL shall be analyzed in conformance with the provisions of this MANUAL.
4. Developments for which an overall Local Master Drainage Plan has been approved shall be addressed as follows:
 - (a) For new construction affected by facilities designed and constructed (or under construction) at the time of initial MANUAL and/or revision adoption based on an approved master plan shall be analyzed using flow rates and volumes calculated per the requirements of this MANUAL. If these facilities pass the revised peak flows and volumes within the freeboard limits of the facility, then the facility shall be considered to have adequate capacity. If not, then the owner or developer shall submit a plan which discusses the impact of flows exceeding the capacity of the originally designed system and proposed solutions to minimize these impacts.
 - (b) Facilities planned but not under construction at the time of initial MANUAL adoption shall also be analyzed as discussed in 109.4 (4) (a) above. However, if the facility does not have adequate capacity including freeboard, the facility shall be redesigned in accordance with the requirements of the MANUAL.

- (c) Local facilities for specific subdivisions within the master planned area for which a separate detailed drainage report and/or analysis is required shall be addressed as discussed in 1. and 2. above.

110 ACRONYMS AND ABBREVIATIONS

The following acronyms and abbreviations are used within the contents of this MANUAL:

A	Area
BFE	Base Flood Elevation
BMP	Best Management Practices
CAC	Clark County Regional Flood Control District Citizens Advisory Committee
CAP	Corrugated Aluminum Pipe
CAPA	Corrugated Aluminum Pipe Arch
CCPW	Clark County Public Works
CCRFCDD	Clark County Regional Flood Control District
CEC	Consulting Engineers Council
CLOMA	Conditional Letter of Map Amendment
CLOMR	Conditional Letter of Map Revision
CLV	City of Las Vegas
CMP	Corrugated Metal Pipe
CMPA	Corrugated Metal Pipe Arch
CN	Curve Number
CNLV	City of North Las Vegas
COH	City of Henderson
CSP	Corrugated Steel Pipe

CSPA	Corrugated Steel Pipe Arch
EGL	Energy Grade Line
FAA	Federal Aviation Administration
ft	feet, foot
FEMA	Federal Emergency Management Agency
FIRM	Flood Insurance Rate Map
fps	feet per second
HDS	Hydraulic Design Series
HEC	Hydraulic Engineering Circular
HERCP	Horizontal Elliptical Reinforced Concrete Pipe
HGL	Hydraulic Grade Line
HOA	Home Owners Association
hr	hour(s)
in	inch(es)
LOMA	Letter of Map Amendment
LOMR	Letter of Map Revision
mi	mile(s)
min	minute(s)
NFIP	National Flood Insurance Program
NGVD 29	National Geodetic Vertical Datum of 1929
NOAA	National Oceanic and Atmospheric Administration
NPDES	National Pollutant Discharge Elimination System
NRS	Nevada Revised Statutes

NWS	National Weather Service
NURP	Nationwide Urban Runoff Program
NDOT	Nevada Department of Transportation
NDEP	Nevada Division of Environmental Protection
NRCS	National Resources Conservation Service (formerly SCS, Soil Conservation Service)
NRS	Nevada Revised Statutes
NAVD 88	North American Vertical Datum of 1988
PE	Professional Engineer (Licensed by the State of Nevada)
PMF	Probable Maximum Flood
PMR	Physical Map Revision
RCBC	Reinforced Concrete Box Culvert
RCP	Reinforced Concrete Pipe
ROW	Right-of-Way
RTC	Regional Transportation Commission of Clark County
SFHA	Special Flood Hazard Area
SNHBA	Southern Nevada Home Builders Association
SPP	Structural Plate Pipe
SPPA	Structural Plate Pipe Arch
sq mi	square mile(s)
SWPPP	Storm Water Pollution Prevention Plan
TAC	Clark County Regional Flood Control District Technical Advisory Committee
t_c	time of concentration

t_i	initial inlet or overland flow time
t_p	time-to-peak
t_t	travel time
TRC	Clark County Regional Flood Control District Technical Review Committee
USACE	United States Army Corps of Engineers
USBR	United States Bureau of Reclamation
USEPA	United States Environmental Protection Agency
USGS	United States Geological Survey

111 GLOSSARY

The following glossary is provided as an aid in the understanding of some of the terms and abbreviations included in this MANUAL. Section numbers where the term is first mentioned are indicated in parenthesis.

All Weather Access: (Section 203.1) The ability to access a site during a Major Storm.

BOARD: (Section 101) The Clark County Regional Flood Control District's Board of Directors.

Local Flood Control Facilities: (Section 303.4) All facilities which collect and convey stormwater from the local area into a Regional Flood Control Facility.

Local Off-Site (Public) Flood Control Facilities: (Section 303.4) All facilities which are dedicated to the public and collect and convey stormwater from the Local Off-Site Flood Control Facilities to a Regional Flood Control Facility.

Local On-Site (Private) Flood Control Facilities: (Section 303.4) All facilities which are privately owned and maintained and collect and convey stormwater from a single unified development or parcel to the Local Off-Site Flood Control Facilities. These facilities serve only the development or parcel in question.

Major Storm: (Section 304.2) The design storm having a recurrence interval of 100 years which may cause major damage to public property and possible loss of life.