HYDROLOGY

H12/D7
5 PLANS

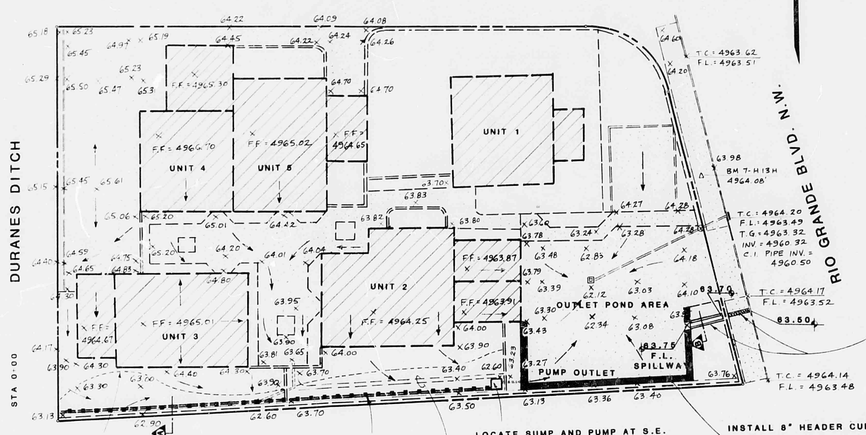
H12/D7

5 PLANS

I, CHRISTOPHER L. WEISS, HEREBY CERTIFY THAT THE COMPLETED CONSTRUCTION OF THE DRAINAGE IMPROVEMENTS FOR PATIOS LOS ANAYAS ARE IN SUBSTANTIAL COMPLIANCE WITH THE APPROVED PLANS.

CHRISTOPHER L. WEISS — DATE 6-30-86

SCALE 1" = 20'



RECONSTRUCT SIDEWALK GRATE DRAIN TO MATCH GRADES APPROVED IN S.O. #19 DOCUMENT. CONNECT GRATE DRAIN TO PARKING AREA WITH SECTION B CONCRETE RUNDOWN. ESTABLISH A CONSTANT FLOWLINE THROUGH EXISTING WALL LOCATED ACROSS SPILLWAY FLOW PATH

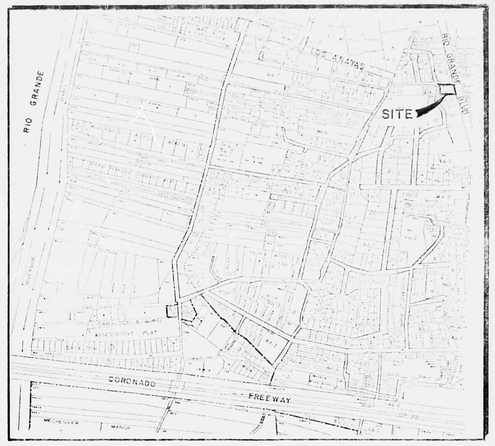
DASHED LINE REPRESENTS APPROX. LOCATION OF TEMPORARY BACKWATER FOR A 100 YEAR STORM WITH EXISTING LANDSCAPED YARDS. WHERE POSSIBLE, GRADE YARDS TO PROVIDE CONSTANT SLOPE TO DRAIN LINE

INSTALL 6" PVC LINE IN GRAVEL DRAIN FIELD

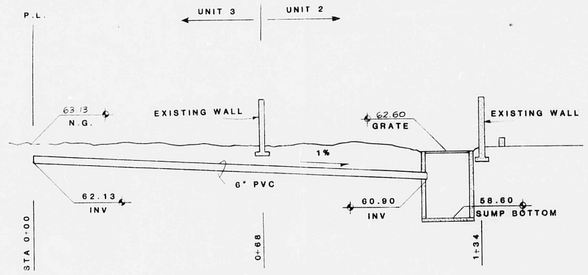
LOCATE SUMP AND PUMP AT S.E. CORNER OF UNIT 2 LOT. PROVIDE POSITIVE SURFACE GRADE TO SUMP

INSTALL 8" HEADER CURB CURB ALONG EDGE OF EXISTING CONCRETE PARKING AREA. PROVIDE TWO OPENINGS - ONE FOR PUMP OUTLET, ONE FOR SPILLWAY RUNDOWN

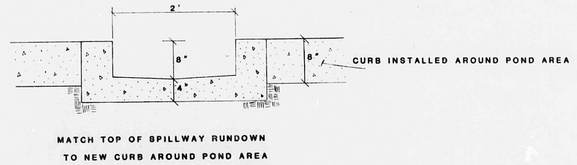
EXISTING GRAVEL DRAIN TO BE USED AS OVERFLOW OUTLET FROM REAR YARDS TO OUTLET POND IN THE EVENT OF POWER FAILURE FOR PUMP



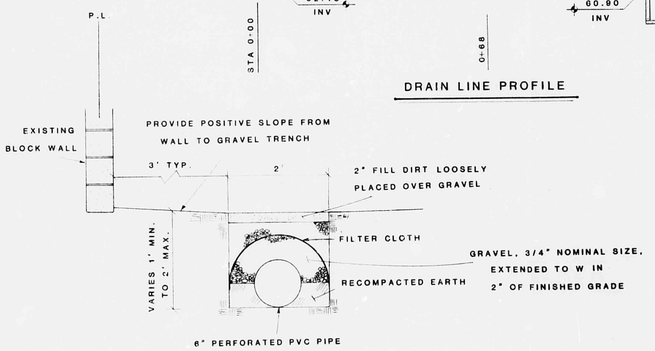
VICINITY MAP - H-12



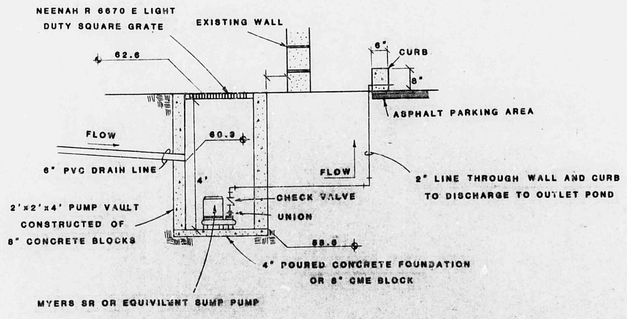
DRAIN LINE PROFILE



SECTION B



SECTION A



SUMP PUMP DETAIL

CORRECTION OF DRAINAGE PROBLEMS

A. Water standing against wall on South Property Line

During heavy rains, water is trapped in the owners landscaped areas south of Units 2 & 4. Due to existing topography, the water collects against the block wall on the south Property Line.

Remedy - One 6" perforated PVC drainage line will be laid in a gravel-filled trench (see as near as practicable along the out Property Line. A 2'x2'x4' concrete pump vault will accept runoff from the drain line, and an 85 gpm pump will transfer water out of the vault and over the existing housing unit to the existing street drain. Water accumulated against the Sout Property Line will be discharged.

1. Runoff (Rational Method)

$Q_{100} = CIA = (0.6)(6.75 \text{ in./hr.})(0.07 \text{ ac})$

$Q_{100} = 0.67 \text{ cfs}$

2. Volume

$V_{100} = \text{Area} = \frac{(50 \text{ min.})(60 \text{ sec./min.})(0.67 \text{ cfs})}{2} = V_{100} = 1005 \text{ ft.}^3$

3. Q pump = 92 gpm = 0.18 cfs

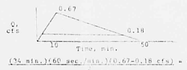
(Myers SR or equivilent pump curve @ 6' head)

4. From Kutter's Formula, a 6" dia. PVC line will carry 0.70 cfs.

5. Time required to remove V_{100} -

$\frac{(1005 \text{ ft.}^3)(7.48 \text{ gal/ft.}^3)}{92 \text{ gpm}} = 91.7 \text{ min.}$

6. Water backup due to pump capacity



$\frac{(35 \text{ min.})(60 \text{ sec./min.})(0.67-0.18 \text{ cfs})}{2} = 499.8 \text{ ft.}^3$

Subtract volume stored in existing 18"x24"x60" gravel trench, new 2'x2'x4' pump vault - 100 ft.^{3} total.

$499.8 \text{ ft.}^3 - 100 \text{ ft.}^3 = 400 \text{ ft.}^3$ potential ponding

Water would pond as to 8" deep over approximately 600 ft.^{2} of the area in question for a period of 90 minutes. The limits of the pond would approach elevation 4963.5 which is below all finished floor elevations on adjacent lots.

B. Storage pond spillway not operable

In case the storage pond outlet drain becomes blocked, an overflow spillway has been provided to protect the property. However, the elevation of the inlet to the spillway is too high to accept runoff from a full storage pond.

Remedy - Reconstruct existing sidewalk grate drain to match grades approved in S.O. #19 and provide a concrete rundown to connect grate drain to the parking lot ponding area.

1. Runoff (Rational Method)

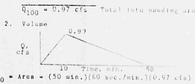
$Q_{100} = CIA = (0.90)(6.75 \text{ in./hr.})(0.07 \text{ ac})$

$Q_{100} = 0.30 \text{ cfs}$ (ponding area)

$Q_{100} = 0.67 \text{ cfs}$ (sump pump area)

$Q_{100} = 0.97 \text{ cfs}$ Total into ponding area

2. Volume



$V_{100} = \text{Area} = \frac{(50 \text{ min.})(60 \text{ sec./min.})(0.97 \text{ cfs})}{2} = V_{100} = 1455 \text{ ft.}^3$

3. Overflow level of ponding area

The existing ponding area will hold 1455 ft.^{3} of water at an elevation of 4963.75 ft. This is the total volume of a 100-year storm that reaches the ponding area. All other runoff from the property drains north into Los Anayas Road or is trapped in some of the patio landscaped areas. The elevation of the pond spillway inlet will be established at 4963.75'.

RECEIVED NOV 24 1986 HYDROLOGY SECTION

WEISS-HINES ENGINEERING INC.
1100 ALVARADO N.E. SUITE B
ALBUQUERQUE, NEW MEXICO 87110
(505) 266-3444

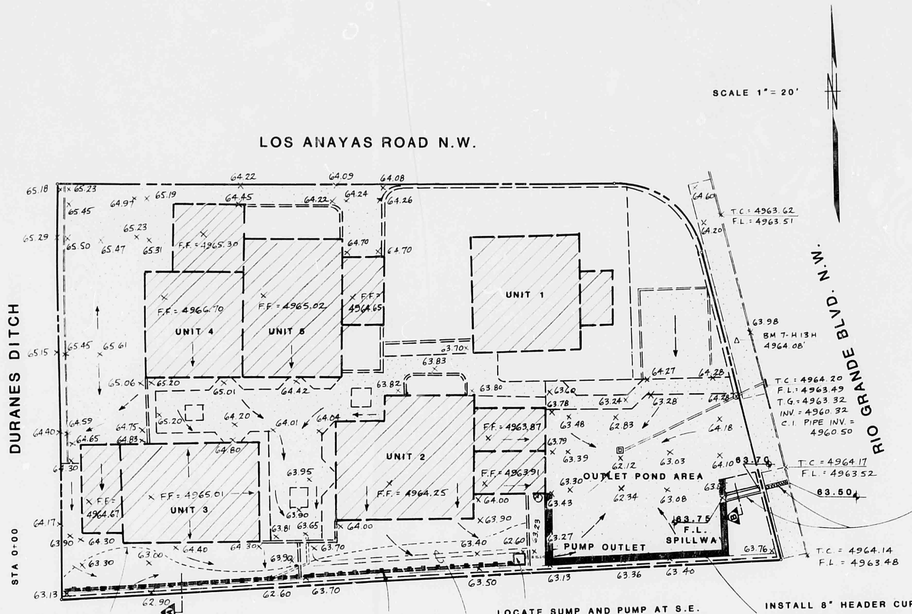
REVISIONS | DATE
DESIGNED
DRAWN
CHECKED

DRAINAGE / GRADING PLAN
PATIOS LOS ANAYAS
TRACT 58 M.R.G.C.D. MAP # 35

WHEELER ENGINEERING

CHRISTOPHER L. WEISS — NEW MEXICO — REGISTERED PROFESSIONAL ENGINEER

SHEET 1 OF 1



DASHED LINE REPRESENTS APPROX. LOCATION OF TEMPORARY BACKWATER FOR A 100 YEAR STORM WITH EXISTING LANDSCAPED YARDS. WHERE POSSIBLE, GRADE YARDS TO PROVIDE CONSTANT SLOPE TO DRAIN LINE

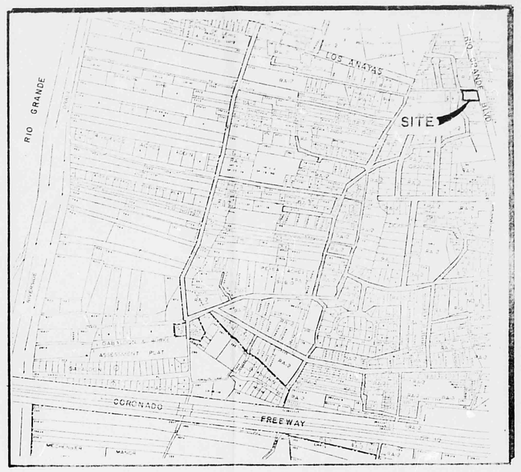
INSTALL 6" PVC LINE IN GRAVEL DRAIN FIELD

LOCATE SUMP AND PUMP AT S.E. CORNER OF UNIT 2 LOT. PROVIDE POSITIVE SURFACE GRADE TO SUMP

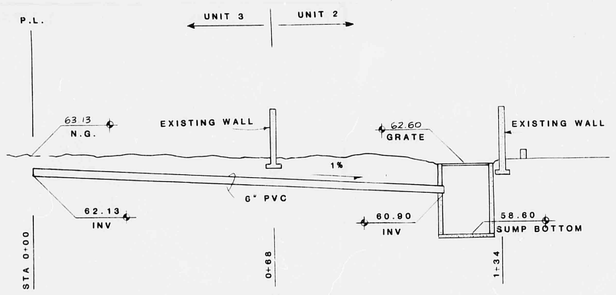
EXISTING GRAVEL DRAIN TO BE USED AS OVERFLOW OUTLET FROM REAR YARDS TO OUTLET POND IN THE EVENT OF POWER FAILURE FOR PUMP

INSTALL 8" HEADER CURB CURB ALONG EDGE OF EXISTING CONCRETE PARKING AREA. PROVIDE TWO OPENINGS – ONE FOR PUMP OUTLET, ONE FOR SPILLWAY RUNDOWN

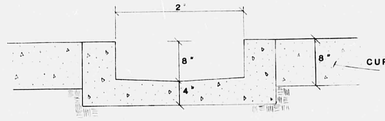
RECONSTRUCT SIDEWALK GRATE DRAIN TO MATCH GRADES APPROVED IN S.O. #19 DOCUMENT. CONNECT GRATE DRAIN TO PARKING AREA WITH SECTION B CONCRETE RUNDOWN. ESTABLISH A CONSTANT FLOWLINE THROUGH EXISTING WALL LOCATED ACROSS SPILLWAY FLOW PATH



VICINITY MAP – H-12



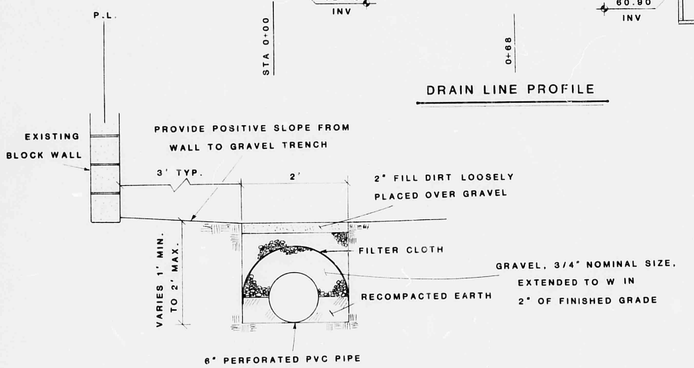
DRAIN LINE PROFILE



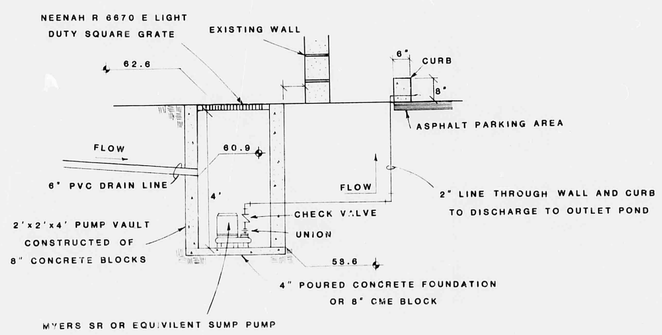
CURB INSTALLED AROUND POND AREA

MATCH TOP OF SPILLWAY RUNDOWN TO NEW CURB AROUND POND AREA

SECTION B



SECTION A



SUMP PUMP DETAIL

CONSTRUCTION OF DRAINAGE PROBLEMS

A. Water standing against wall on South Property line

During heavy rains, water is trapped in the owner-landscaped areas south of Units 3 & 4. Due to existing topography, the water collects against the block wall at the South Property line.

Remedy – One 6" perforated PVC drainage line will be laid in a gravel-filled trench due as near as practicable along the South Property line. A 2'x2'x4' concrete sump vault will accent runoff from the drain line, and an 8" pump and will discharge water from the sump vault into the existing building, and thence to landscaped areas of the sidewalks. The 6" PVC pipe will be laid in a 3' wide x 2' deep accumulation trench along South Property line (see Sheet 1 of 1).

1. Runoff (Rational Method)

$Q_{100} = CIA = (0.67)(4.3 \text{ in./hr.})(0.07 \text{ ac.})$

$Q_{100} = 0.67 \text{ cfs.}$

2. Volume

$V_{100} = \text{Area} = \frac{(50 \text{ min.})(60 \text{ sec./min.})(0.67 \text{ cfs})}{2} = V_{100} = 1005 \text{ ft.}^3$

3. Q pump = 82 gpm = 0.18 cfs

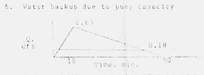
(Myers SR or equivilent pump curve @ 6' head)

4. From Kutter's formula, a 6" dia. PVC line will carry 0.70 cfs.

5. Time required to remove V_{100} =

$\frac{(1005 \text{ ft.}^3)(7.481 \text{ gal/ft.}^3)}{82 \text{ gpm}} = 91.2 \text{ min.}$

6. Water backup due to pump capacity



$(50 \text{ min.})(60 \text{ sec./min.})(0.67-0.18 \text{ cfs}) = 490.8 \text{ ft.}^3$

Subtract volume stored in existing 18"x24"x50' gravel trench, new 3'x2'x4' pump vault, and 6" PVC pipe

$490.8 \text{ ft.}^3 - 100 \text{ ft.}^3 - 100 \text{ ft.}^3$ = potential ponding

Water would pond up to 2' deep over approximately 600 ft.^{2} of the area in question. Assuming a 2' deep ponding, the depth of the pond would approach overflow 4963.5 which is below the elevation of the first floor of the building.

B. Storage pond spillway not capable

In case the storage pond outlet drain becomes blocked, an overflow spillway has been provided to protect the property. However, the elevation of the inlet to the spillway is too high to accept runoff from a full storage pond.

Remedy – Reconstruct existing sidewalk grate drain to match grades approved in S.O. #19 and provide a concrete rundown to connect grate drain to the parking lot ponding area.

1. Runoff (Rational Method)

$Q_{100} = CIA = (0.90)(4.3 \text{ in./hr.})(0.07 \text{ ac.})$

$Q_{100} = 0.30 \text{ cfs}$ (ponding area)

$Q_{100} = 0.67 \text{ cfs}$ (pump out area)

$Q_{100} = 0.97 \text{ cfs}$ = total to ponding area

2. Volume

$V_{100} = \text{Area} = (50 \text{ min.})(60 \text{ sec./min.})(0.97 \text{ cfs}) = V_{100} = 1452 \text{ ft.}^3$

3. Overflow level of ponding area

The existing ponding area will hold 1455 ft.^{3} of water at an elevation of 4963.75 ft. This is the total volume of a 100-year storm that reaches the ponding area. All other runoff from the property flows north into Los Anayas Road or is trapped in some of the patio landscaped areas. The elevation of the pond spillway inlet will be established at 4963.75'.

RECEIVED
AUG 22 1985
HYDROLOGY SECTION

WEISS-HINES ENGINEERING INC.
1100 ALVARADO N.E. SUITE B
ALBUQUERQUE, NEW MEXICO 87110
(505) 266 - 3444

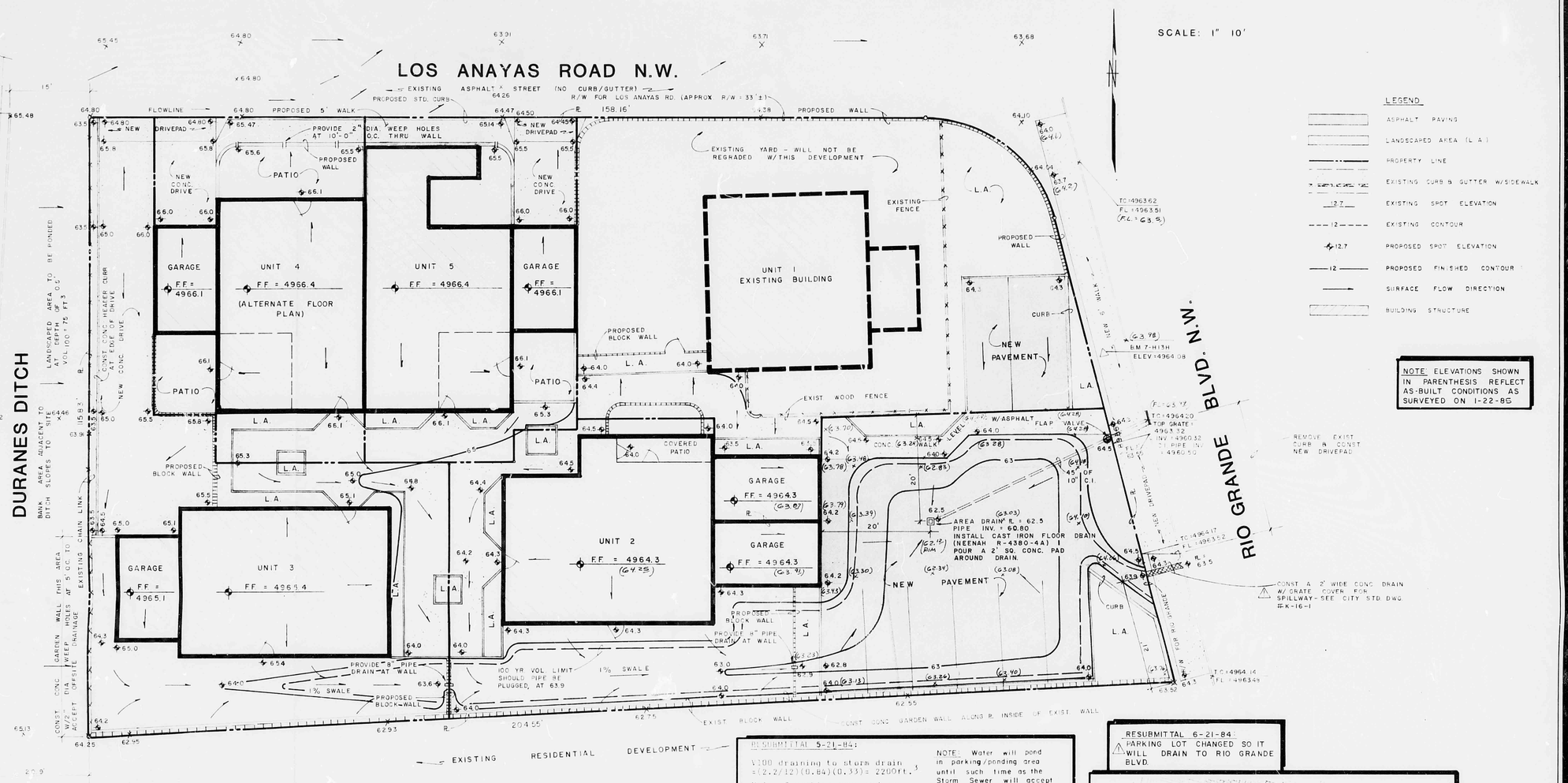
REVISIONS	DATE
DESIGNED SC	6-85
DRAWN SC	"
CHECKED CLS	

DRAINAGE / GRADING PLAN
PATIOS LOS ANAYAS
TRACT 58
M.R.G.C.D. MAP # 35

ENGINEERING

CHRISTOPHER L. SMITH
NEW MEXICO
6863
PROFESSIONAL ENGINEER

SHEET 1 OF 1



LEGEND

- ASPHALT PAVING
- LANDSCAPED AREA (L.A.)
- PROPERTY LINE
- EXISTING CURB & GUTTER W/SIDEWALK
- 12.7 EXISTING SPOT ELEVATION
- 12 EXISTING CONTOUR
- 12.7 PROPOSED SPOT ELEVATION
- 12 PROPOSED FINISHED CONTOUR
- SURFACE FLOW DIRECTION
- BUILDING STRUCTURE

NOTE: ELEVATIONS SHOWN IN PARENTHESIS REFLECT AS-BUILT CONDITIONS AS SURVEYED ON 1-22-85

NOTES

1. Legal: Lots 1, 2, 3 and 4, Patios Los Anayas (comprising Tract 58 MRGCD Map 35), Albuquerque, New Mexico.
2. B.M.: City B.M. F-H13M, Elevation 4964-08.
3. Surveyor: Way John Surveying Company.
4. Soil Type: "Ge", Hydrologic soil group "B".
5. Flood Hazard: None
6. Offsite Drainage: Offsite drainage intercepted on west by Duranes Ditch, on the north and east by existing streets, on the south by an existing block wall.
7. Drainage Criteria: Established at predesign meeting with City Hydrology on 1-31-84:
   a. Drainage Plan per DPM
   b. Discharge to Rio Grande Blvd. storm sewer via catch basin adjacent to property.
   c. Provide easements or drainage covenents for drainage across lot lines.
8. Proposed development will consist of 4 new structures, incorporated around an existing unit (#1). Unit #1 will not be affected by new grading around the structure. Units 2-5 will be developed to drain to a common storm drain system located along south side of site, which will be connected to the City storm drain system in Rio Grande Blvd.
   a. Undeveloped Site: Q100 = (0.40)(4.73)(0.49Ac) = 1.3 c.f.s.
   b. Developed Site: Q100 to Los Anayas Road = (0.59)(4.73)(0.84) = 0.7 c.f.s.
      -Q100 to storm drain = (0.84 - .73)(0.13 = 1.3 - .7 = .6
      -Drain: Use 1st C.L. line @ 0.67% (Kutter's formula indicates pipe will carry 1.3 c.f.s..
9. S.D. #11: Submitted to City design for storm sewer connection to City drain.

RESUBMITTAL 5-21-84:

Q100 draining to storm drain =(2.2/12)(0.84)(0.33)= 2200ft.³

Vol. of parking area and upstream swale @ elev. 64.0

NOTE: Water will pond in parking/ponding area until such time as the Storm Sewer will accept outflow.

Elev.	Area	Avg.	Interval	Total Vol.
62.5	0			
63.0	1317	659	0.5	329
64.0	3255	2286	1.0	2286

Pond = 2615 ft.³ > 2200 ft.³ required, O.K.

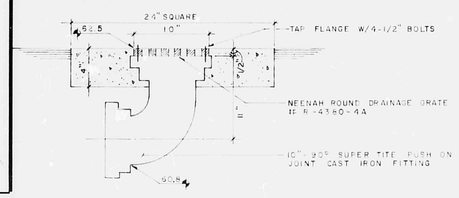
As-Built Pond Volume

Elev.	Area	Interval	Volume
62.1	0		
62.4	66.7	0.3	10
62.6	172.1	0.2	24
62.8	345.7	0.2	52
63.0	592.1	0.2	94
63.2	1161.0	0.2	175
63.75	2752.0	0.55	1076
64.0	3735.0	0.25	810
			2241 ft.³

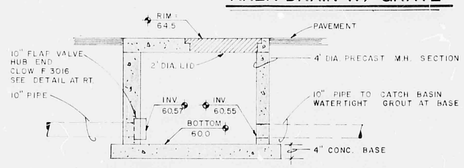
Certification

I, Christopher L. Weiss, certify that the drainage pond and its out-flow system have been installed in substantial compliance to the approved plans.

Christopher L. Weiss — Date



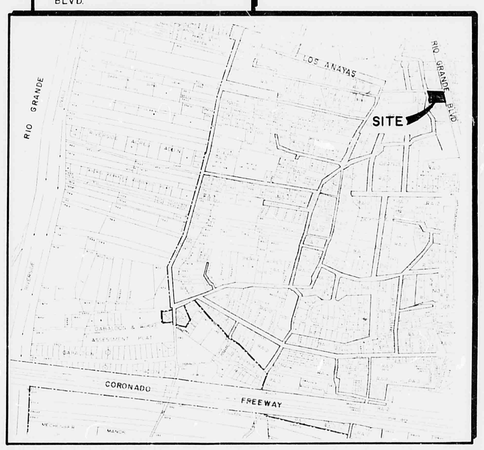
AREA DRAIN W/GRATE



BACKFLOW CHECK VALVE/VAULT
(SEE PLAN FOR LOCATION)

F-3016 HUB END CHECK VALVE

RESUBMITTAL 6-21-84:
PARKING LOT CHANGED SO IT WILL DRAIN TO RIO GRANDE BLVD.



VICINITY MAP - H-12

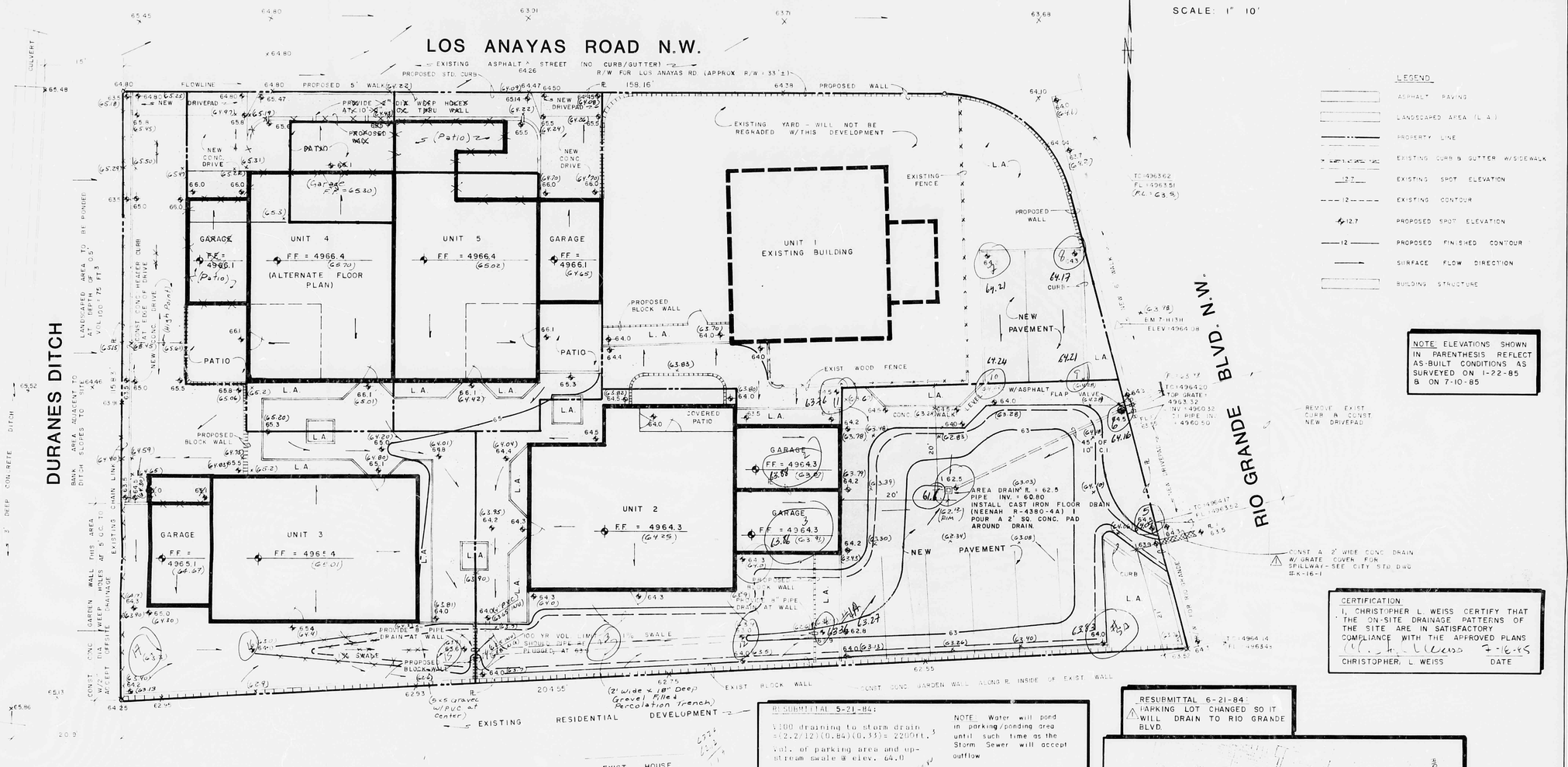
RECEIVED APR 23 1985 HYDROLOGY SECTION

C.T.S. INC. ENGINEERING
1100 ALVARADO N.E. SUITE A
ALBUQUERQUE, NEW MEXICO 87110
(505) 266-3444

REVISIONS | DATE
DESIGNED
DRAWN
CHECKED

DRAINAGE / GRADING PLAN
PATIOS LOS ANAYAS
Tract 58
M.R.G.C.D. Map #35

SHEET 1 OF 1



CERTIFICATION

I, CHRISTOPHER L. WEISS CERTIFY THAT THE ON-SITE DRAINAGE PATTERNS OF THE SITE ARE IN SATISFACTORY COMPLIANCE WITH THE APPROVED PLANS

CHRISTOPHER L. WEISS — DATE 7-16-85

RESUBMITTAL 5-21-84:

V100 draining to storm drain = (2.2/12)(0.84)(0.33) = 2200ft.³

vol. of parking area and upstream swale @ elev. 64.0

NOTE: Water will pond in parking/ponding area until such time as the Storm Sewer will accept outflow

Elev.	Area	Avg.	Interval	Total Vol.
62.5	0			
63.0	1317	659	0.5	329
64.0	3255	2286	1.0	2286

Pond = 2615 ft.³ > 2200 ft.³ required, O.K.

RESUBMITTAL 6-21-84:
PARKING LOT CHANGED SO IT WILL DRAIN TO RIO GRANDE BLVD.

As-Built Pond Volume

Elev.	Area	Interval	Volume
62.1	0		
62.4	66.7	0.3	10
62.6	172.7	0.2	24
62.8	345.7	0.2	52
63.0	592.1	0.2	94
63.2	1161.0	0.2	175
63.75	2732.0	0.55	1076
64.0	3735.0	0.25	810
			2241 ft.³

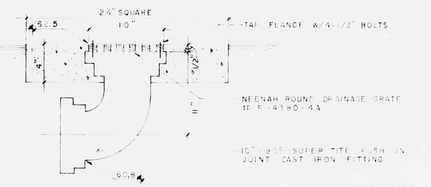
CERTIFICATION

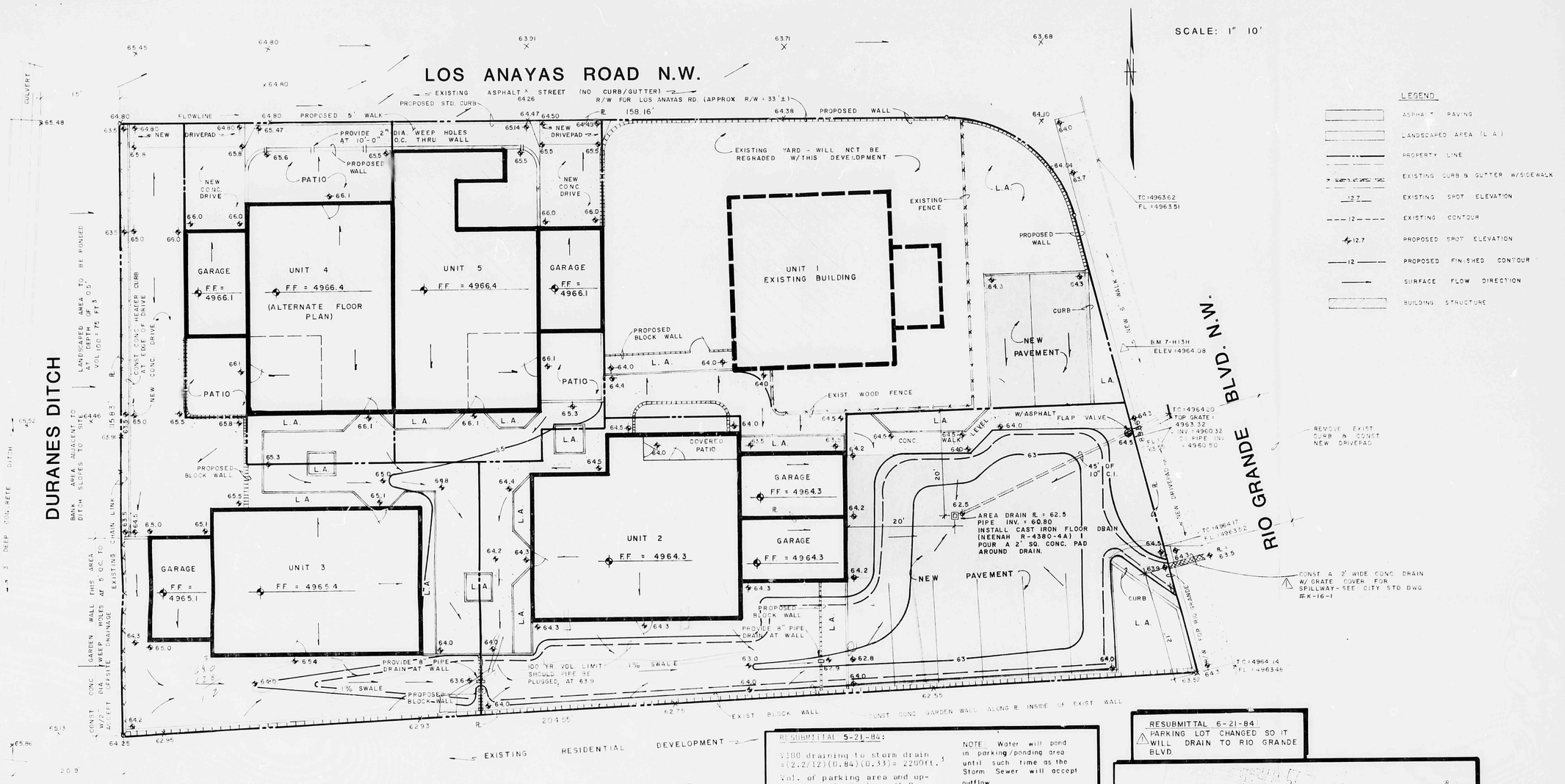
I, Christopher L. Weiss, certify that the drainage pond and its out-flow system have been installed in substantial compliance to the approved plans.

Christopher L. Weiss — Date

Notes

1. Legal: Lots 1, 2, 3 and 4, Patios Los Anayas (formerly Lot 58 MRGCD Map 35), Albuquerque, New Mexico.
2. B.M.: City B.M. F-H13, Elevation 4964.08.
3. Surveyor: Way John Surveying Company.
4. Soil Type: "Oe", Hydrologic soil group "B".
5. Flood Hazard: None
6. Offsite Drainage: Offsite drainage intercepted on west by Duranes Ditch, on the north and east by existing streets, on the south by an existing block wall.
7. Drainage Criteria: Established at predesign meeting with City Hydrology on 1-31-84:
   a. Drainage Plan per DPM
   b. Discharge to Rio Grande Blvd. storm sewer via catch basin adjacent to property.
   c. Provide easements or drainage covenants for drainage across lot lines.
8. Proposed development will consist of 4 new structures, incorporated around an existing unit (#1). Unit #1 will not be affected by grading around the structure. Units 2-5 will be developed to drain to a common storm drain system located along south side, which will be connected to the City storm drain system in Rio Grande Blvd.
   a. Undeveloped Site: Q100 = (0.40)(4.73)(0.896) = 1.7 c.f.s.
   b. Developed Site: Q100 to Los Anayas Road = (0.84)(4.73)(0.96) = 0.2 c.f.s.
   -Q100 to storm drain = (0.84)(4.73)(0.73) = 1.3 c.f.s.
   -Drain: Use 6" PVC line @ 0.67% Patterns remote inlet pipe will carry 1.3 c.f.s.
9. C.O. #19: Submitted to City Design for storm sewer connection to Rio Grande.


24" SQUARE
10"
5.5
4
4
4



NOTES

1. Legal: Lots 1, 2, 3 and 4, Patios Los Anayas (comprising part MRGCD Map 35), Albuquerque, New Mexico.
2. B.M.: City B.M. F-H13H, Elevation 4964.08.
3. Surveyor: Way John Surveying Company.
4. Soil Type: "Se", Hydrologic soil group "B".
5. Flood Hazard: None
6. Offsite Drainage: Offsite drainage intercepted on west by Duranes Ditch, on the north and east by existing streets, on the south by an existing block wall.
7. Drainage Criteria: Established at predesign meeting with City Hydrology on 1-31-84:
   a. Drainage Plan per DPM
   b. Discharge to Rio Grande Blvd. storm sewer via catch basin adjacent to property.
   c. Provide easements or drainage covenants for drainage across lot lines.
8. Proposed development will consist of 4 new structures, incorporated around an existing unit (#3). Unit #3 will not be affected by the proposed new structure. Units 2-5 will be developed to drain to a common storm drain system located along south side of site, which will be connected to the City storm drain system on Rio Grande Blvd.
   a. Undeveloped Site: Q100 = (0.40)(4.73)(0.49ac) = 0.9 c.f.s.
   b. Developed Site: Q100 to Los Anayas Road = (0.52)(4.73)(1.64) = 4.0 c.f.s.
   - Q100 to storm drain = (0.84)(4.73)(.33) = 1.3 c.f.s.
   - Drain: Use 10" C.I., line @ 0.67% (Kutter's formula indicates pipe will carry 1.3 c.f.s.).
9. S.D. #19: Submitted to City design for storm sewer connection to City drain.

RESUBMITTAL 5-21-84:

V100 draining to storm drain = (2.2/12)(0.84)(0.33) = 2200 ft.³

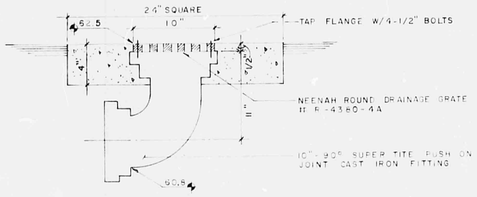
Vol. of parking area and upstream swale @ elev. 64.0

Elev.	Area	Avg.	Interval	Total Vol.
62.5	0			
63.0	1317	659	0.5	329
64.0	3255	2286	1.0	2286

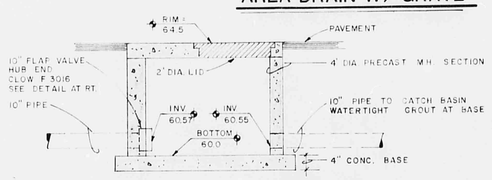
Pond = 2615 ft.³ > 220 ft.³ required, O.K.

NOTE: Water will pond in parking/ponding area until such time as the Storm Sewer will accept outflow

RESUBMITTAL 6-21-84:
PARKING LOT CHANGED SO IT WILL DRAIN TO RIO GRANDE BLVD.

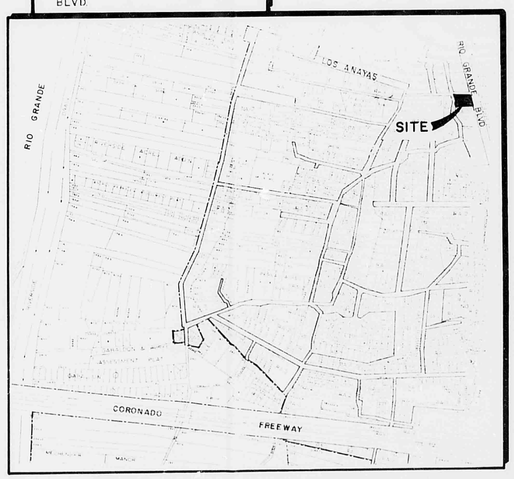


AREA DRAIN W/GRATE



BACKFLOW CHECK VALVE/VAULT
(SEE PLAN FOR LOCATION)

F-3016 HUB END CHECK VALVE



VICINITY MAP - H-12

APPROVED FOR DRAINAGE
7/24/84
DATE
Billy J. Arobalo
SIGNATURE
ADVISE DRAINAGE INSPECTOR WHEN GRADING EXECUTED

C.T.S. ENGINEERING INC.
1100 ALVARADO N.E. SUITE A
ALBUQUERQUE, NEW MEXICO 87110
(505) 266-3444

REVISIONS | DATE
DESIGNED 1984
DRAWN
CHECKED

DRAINAGE / GRADING PLAN
PATIOS LOS ANAYAS
Tract 58 M.R.G.C.D. Map #35

SHEET 1 OF 1