



**PROVINCIA DI GENOVA**



## TORRENTE VARENNA



## PIANO DI BACINO STRALCIO PER LA TUTELA DAL RISCHIO IDROGEOLOGICO

(ai sensi dell'art. 1, comma 1, del D.L.  
180/1998 convertito in L. 267/1998)



## VERIFICHE IDRAULICHE

*Approvato con D.C.P. n.7 del 13/03/2014*

| Elaborato                              | Verificato           | Regolarità tecnica   | Data          | Ed. | Rev. |
|--|----------------------|----------------------|---------------|-----|------|
| Ufficio<br>Pianificazione territoriale | Arch. Andrea Pasetti | Arch. Andrea Pasetti | 13 marzo 2014 | 0   | 0    |

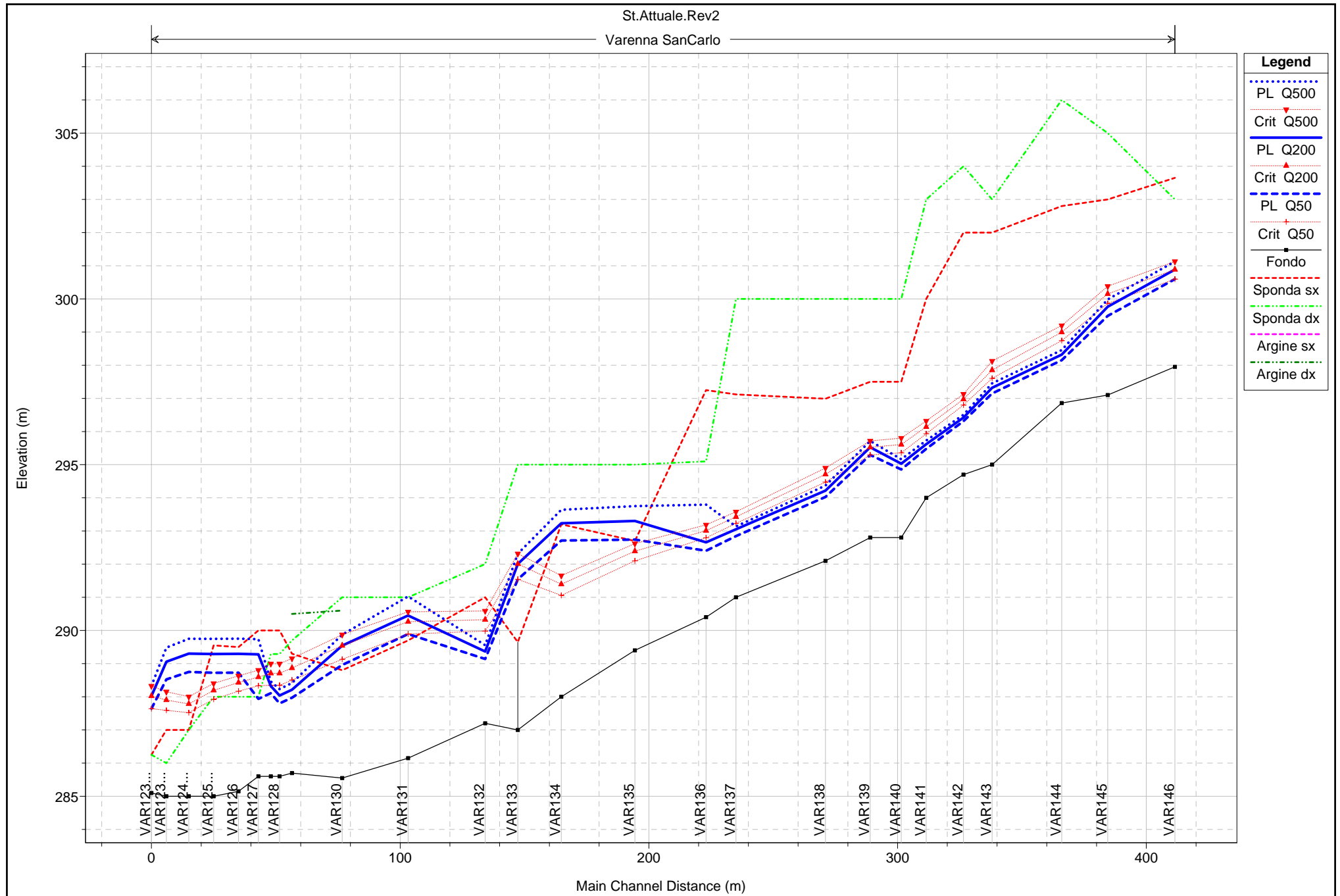
*Piano di Bacino Stralcio del torrente Varenna*  
Verifiche idrauliche

# **Torrente Varenna**

Tratto 1 - dalla sezione VAR146 alla sezione VAR123

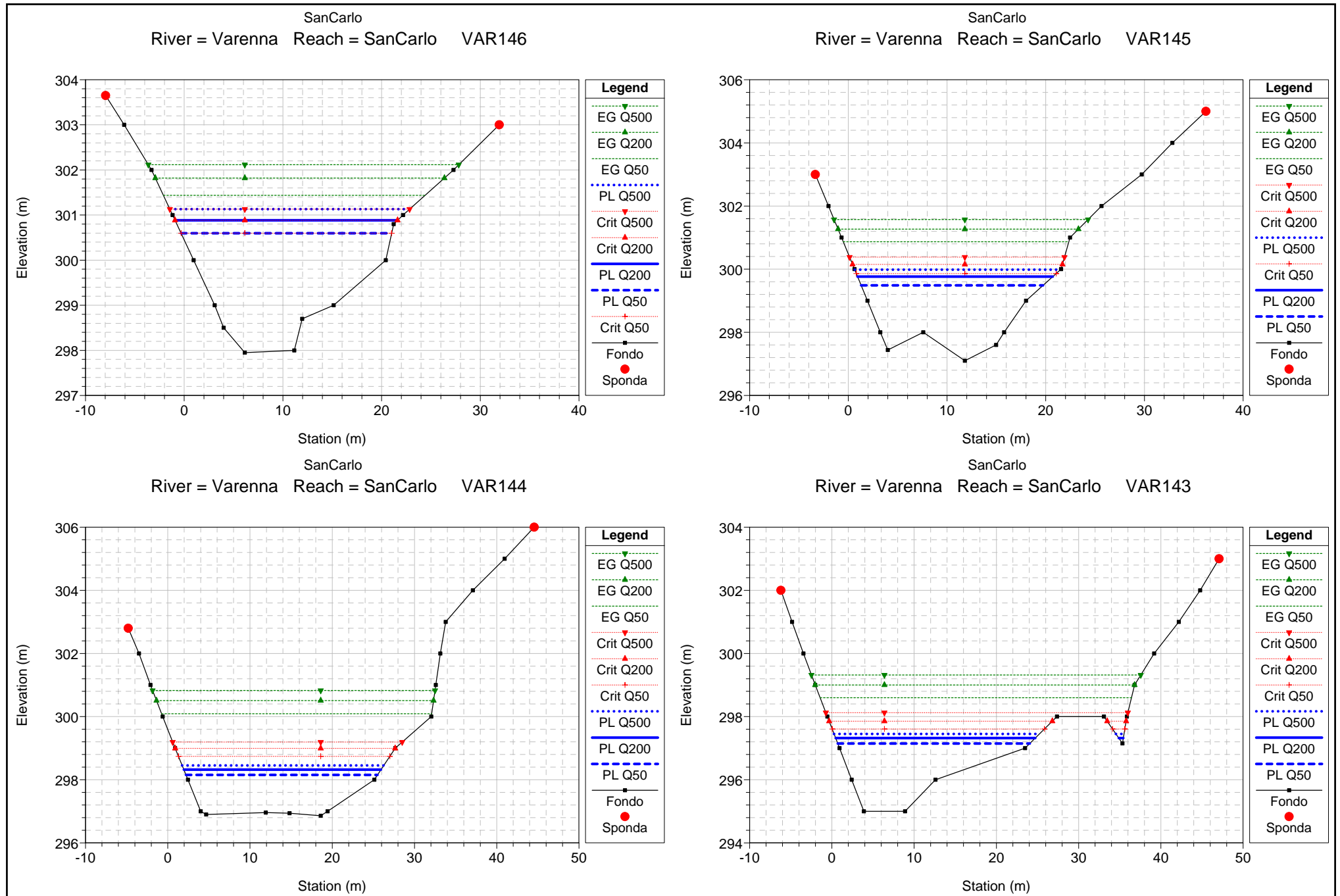
Loc. San Carlo di Cese

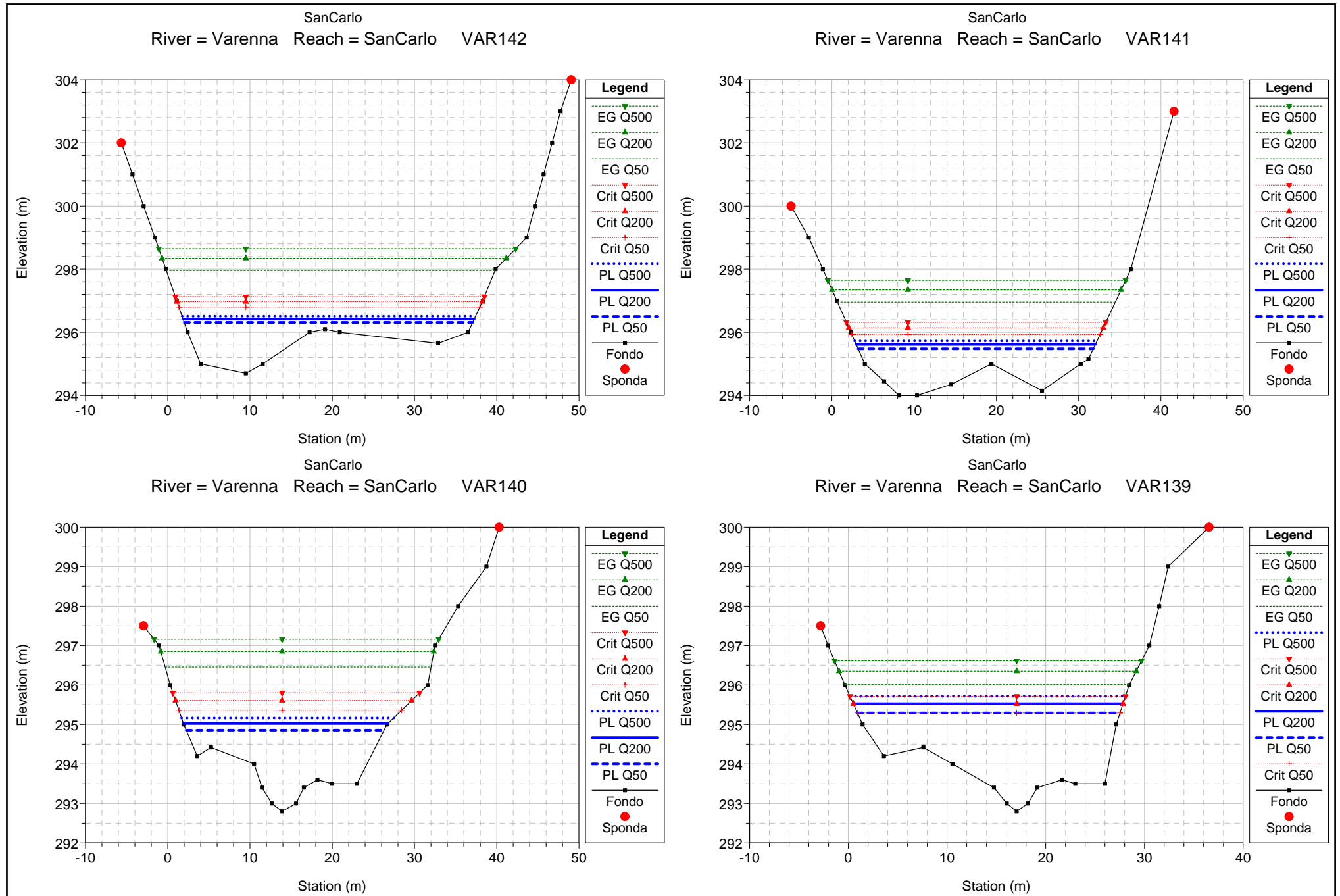
- Profili di corrente
- Sezioni idrauliche
- Tabelle dei risultati

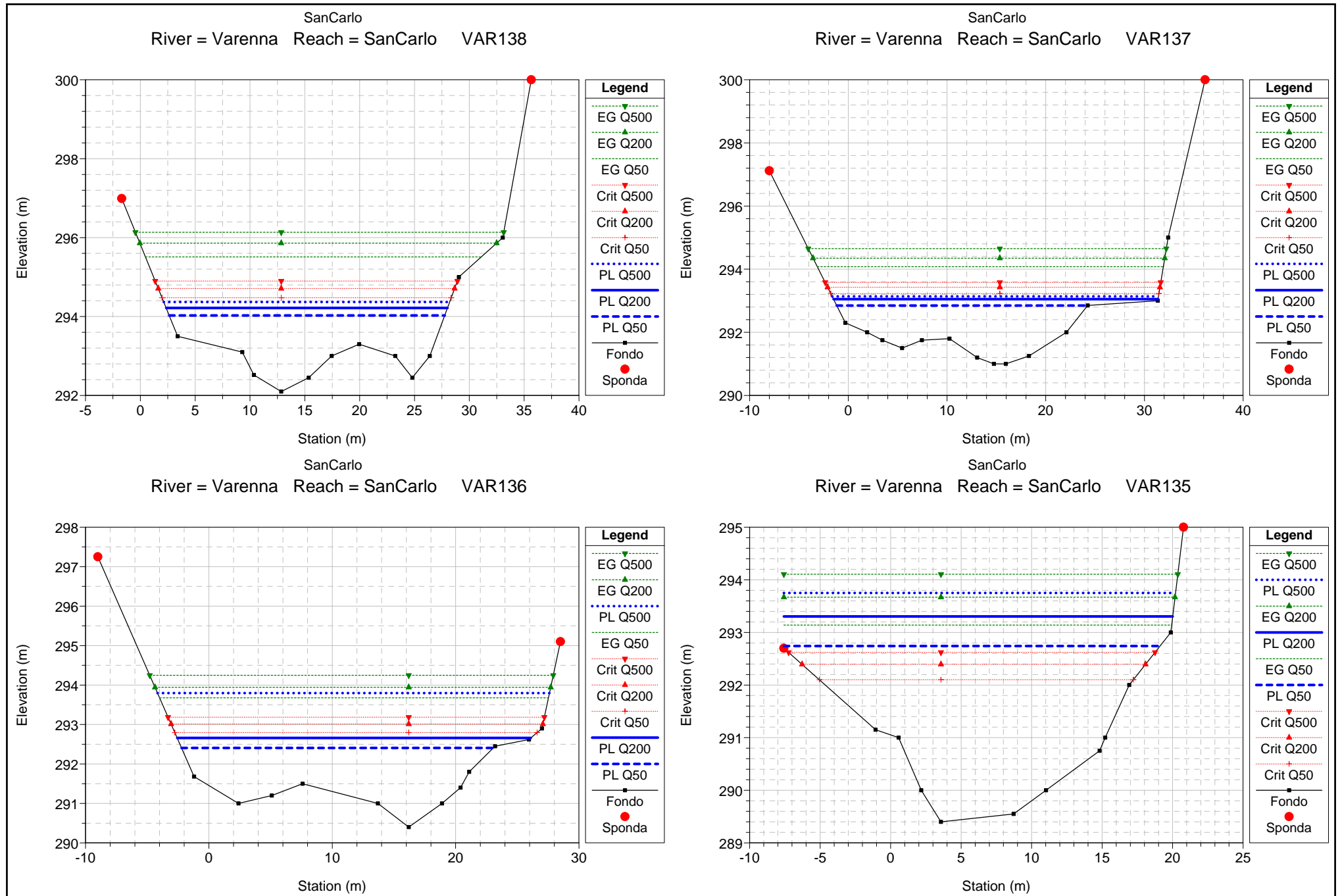


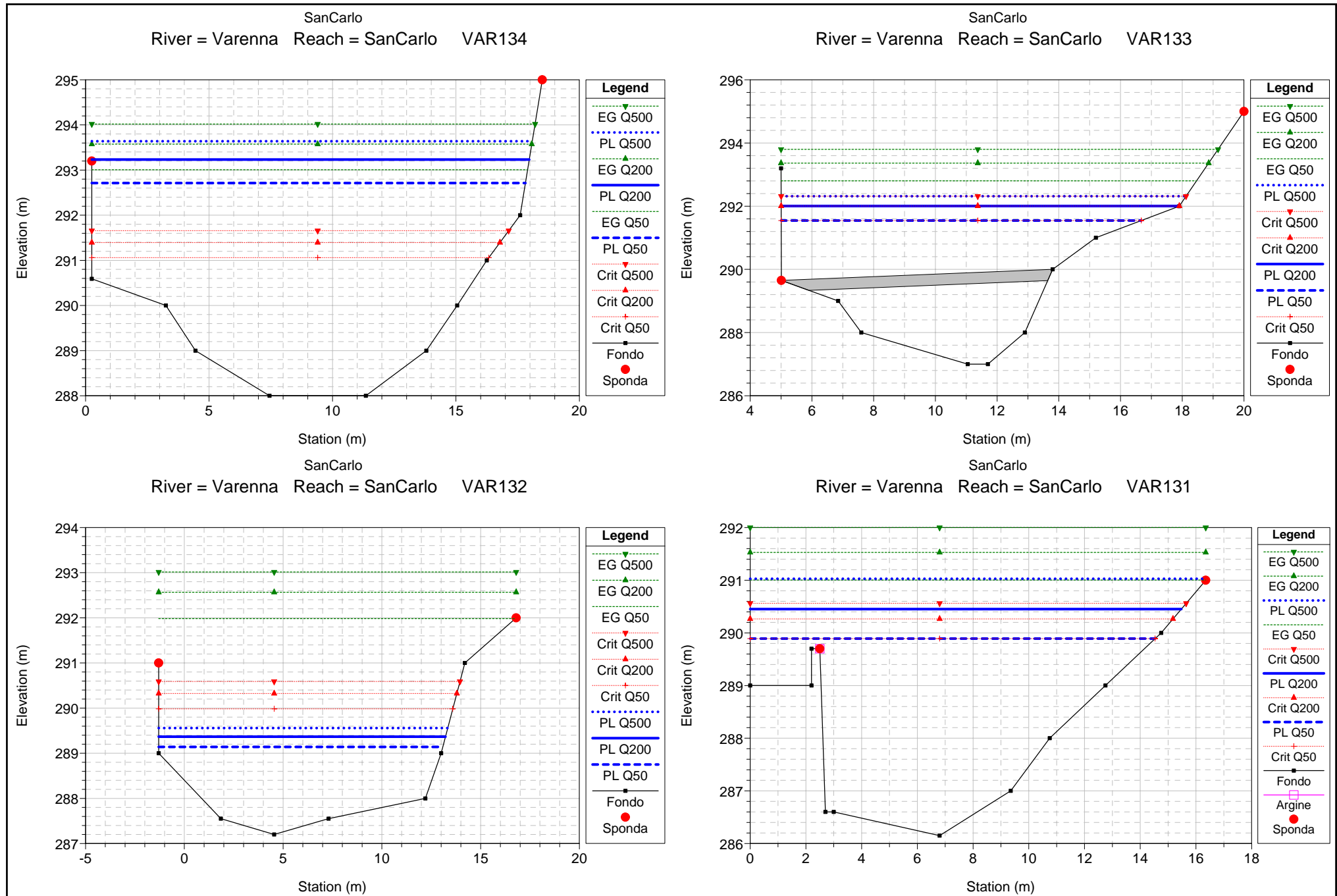
1 cm Horiz. = 20 m 1 cm Vert. = 1.5 m

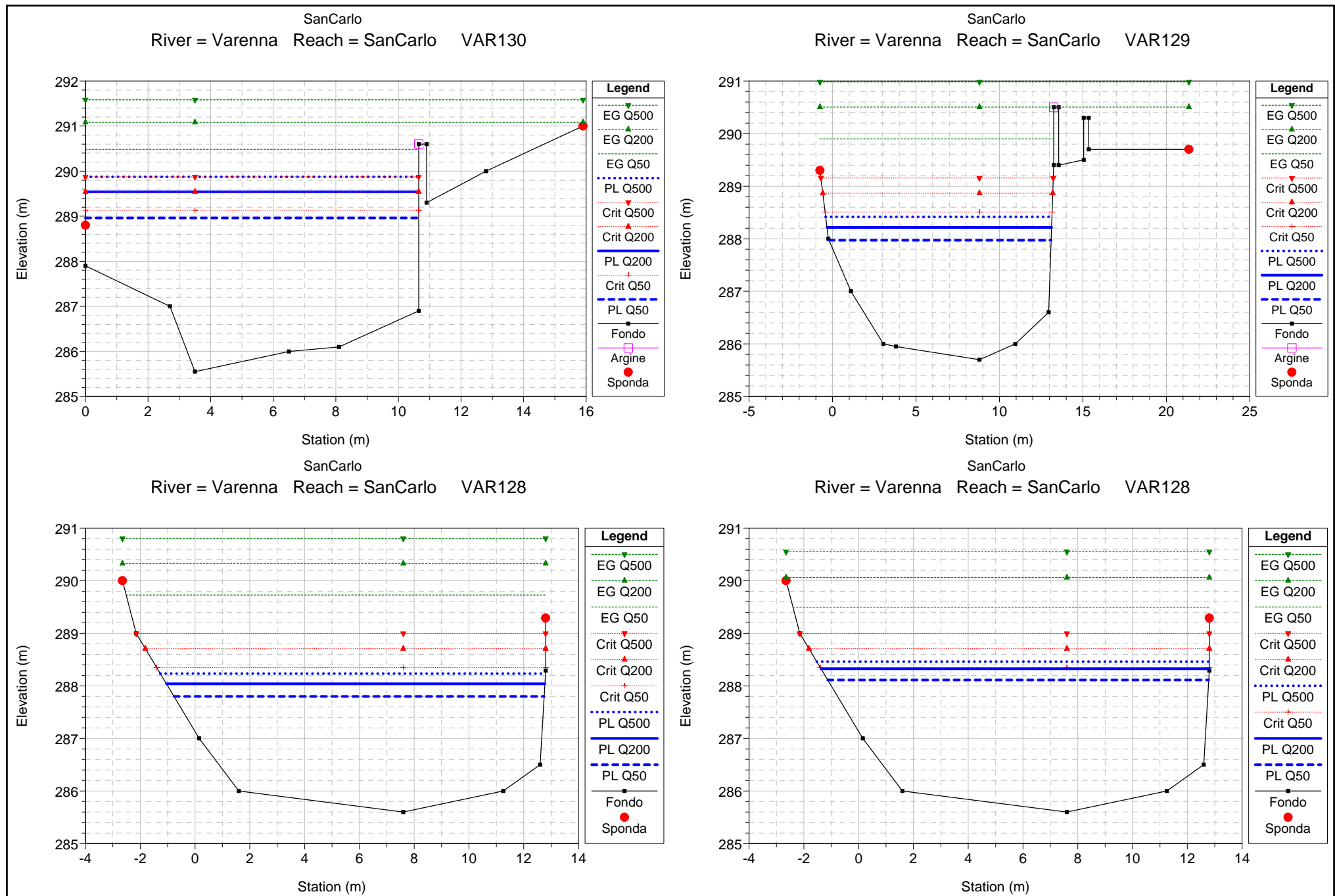
Approvato con DCP n. 7 del 13/03/2014



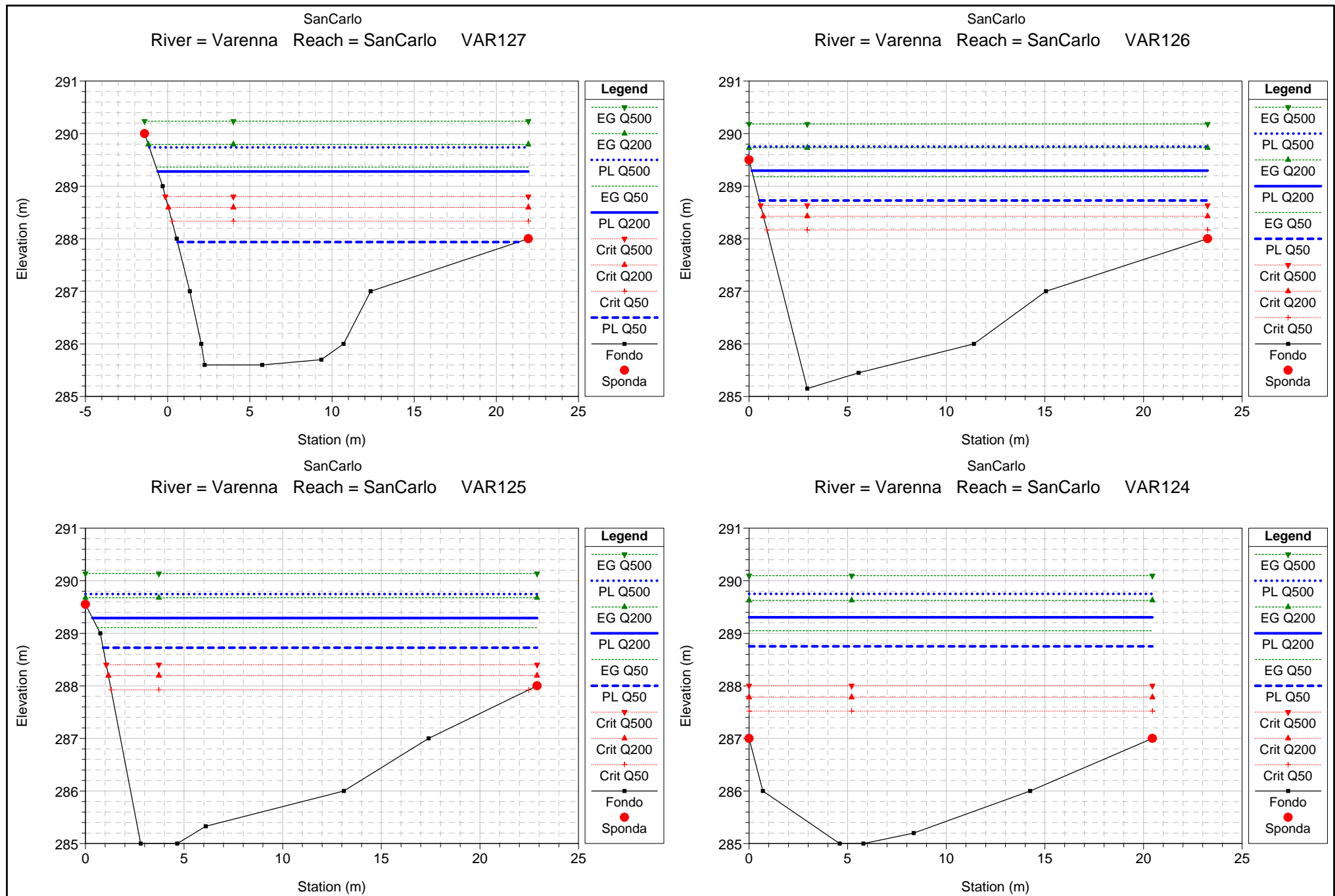


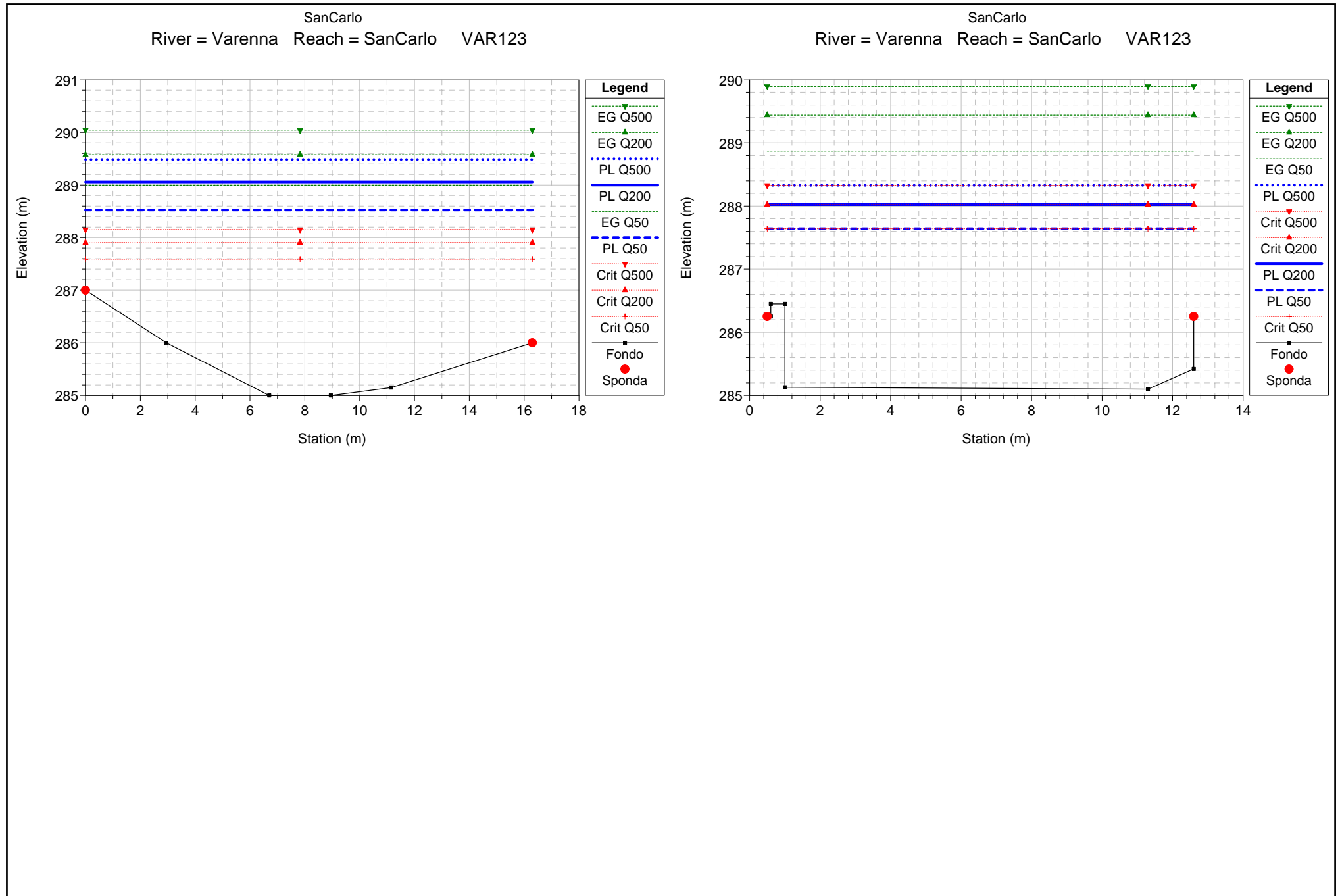












HEC-RAS Plan: SA.rev2 River: Varenna Reach: SanCarlo

| Reach    | River Sta |        | Profile | Q Total<br>(m3/s) | Min Ch El<br>(m) | W.S. Elev<br>(m) | LOB Elev<br>(m) | L. Freeboard<br>(m) | ROB Elev<br>(m) | R. Freeboard<br>(m) | Crit W.S.<br>(m) | E.G. Elev<br>(m) | E.G. Slope<br>(m/m) | Vel Chnl<br>(m/s) | Flow Area<br>(m2) | Top Width<br>(m) | Froude # Chl |
|----------|-----------|--------|---------|-------------------|------------------|------------------|-----------------|---------------------|-----------------|---------------------|------------------|------------------|---------------------|-------------------|-------------------|------------------|--------------|
| SanCarlo | 24        | VAR146 | Q50     | 146.00            | 297.95           | 300.60           | 303.65          | 3.05                | 303.00          | 2.40                | 300.60           | 301.44           | 0.014153            | 4.06              | 35.93             | 21.33            | 1.00         |
| SanCarlo | 24        | VAR146 | Q200    | 181.00            | 297.95           | 300.88           | 303.65          | 2.77                | 303.00          | 2.12                | 300.88           | 301.82           | 0.013753            | 4.29              | 42.22             | 22.55            | 1.00         |
| SanCarlo | 24        | VAR146 | Q500    | 211.00            | 297.95           | 301.13           | 303.65          | 2.52                | 303.00          | 1.87                | 301.13           | 302.12           | 0.013454            | 4.40              | 47.99             | 24.29            | 1.00         |
| SanCarlo | 23        | VAR145 | Q50     | 146.00            | 297.10           | 299.49           | 303.00          | 3.51                | 305.00          | 5.51                | 299.86           | 300.87           | 0.027039            | 5.21              | 28.05             | 18.44            | 1.35         |
| SanCarlo | 23        | VAR145 | Q200    | 181.00            | 297.10           | 299.76           | 303.00          | 3.24                | 305.00          | 5.24                | 300.15           | 301.27           | 0.025794            | 5.43              | 33.31             | 19.78            | 1.34         |
| SanCarlo | 23        | VAR145 | Q500    | 211.00            | 297.10           | 299.98           | 303.00          | 3.02                | 305.00          | 5.02                | 300.38           | 301.57           | 0.024732            | 5.58              | 37.80             | 20.86            | 1.32         |
| SanCarlo | 22        | VAR144 | Q50     | 146.00            | 296.86           | 298.15           | 302.80          | 4.65                | 306.00          | 7.85                | 298.74           | 300.09           | 0.061183            | 6.17              | 23.67             | 23.29            | 1.95         |
| SanCarlo | 22        | VAR144 | Q200    | 181.00            | 296.86           | 298.32           | 302.80          | 4.48                | 306.00          | 7.68                | 299.00           | 300.51           | 0.058714            | 6.56              | 27.61             | 23.97            | 1.95         |
| SanCarlo | 22        | VAR144 | Q500    | 211.00            | 296.86           | 298.46           | 302.80          | 4.34                | 306.00          | 7.54                | 299.19           | 300.83           | 0.056642            | 6.83              | 30.91             | 24.53            | 1.94         |
| SanCarlo | 21        | VAR143 | Q50     | 146.00            | 295.00           | 297.15           | 302.00          | 4.85                | 303.00          | 5.85                | 297.61           | 298.60           | 0.038704            | 5.34              | 27.36             | 23.35            | 1.57         |
| SanCarlo | 21        | VAR143 | Q200    | 181.00            | 295.00           | 297.32           | 302.00          | 4.68                | 303.00          | 5.68                | 297.85           | 299.00           | 0.040657            | 5.75              | 31.50             | 24.83            | 1.63         |
| SanCarlo | 21        | VAR143 | Q500    | 211.00            | 295.00           | 297.45           | 302.00          | 4.55                | 303.00          | 5.55                | 298.13           | 299.32           | 0.042041            | 6.05              | 34.87             | 25.98            | 1.67         |
| SanCarlo | 20        | VAR142 | Q50     | 146.00            | 294.70           | 296.31           | 302.00          | 5.69                | 304.00          | 7.69                | 296.80           | 297.96           | 0.080126            | 5.68              | 25.69             | 35.07            | 2.12         |
| SanCarlo | 20        | VAR142 | Q200    | 181.00            | 294.70           | 296.42           | 302.00          | 5.58                | 304.00          | 7.58                | 296.97           | 298.34           | 0.079264            | 6.15              | 29.45             | 35.41            | 2.15         |
| SanCarlo | 20        | VAR142 | Q500    | 211.00            | 294.70           | 296.51           | 302.00          | 5.49                | 304.00          | 7.49                | 297.13           | 298.65           | 0.078066            | 6.48              | 32.55             | 35.68            | 2.17         |
| SanCarlo | 19        | VAR141 | Q50     | 146.00            | 294.00           | 295.48           | 300.00          | 4.52                | 303.00          | 7.52                | 295.93           | 296.96           | 0.051231            | 5.39              | 27.09             | 28.61            | 1.77         |
| SanCarlo | 19        | VAR141 | Q200    | 181.00            | 294.00           | 295.62           | 300.00          | 4.38                | 303.00          | 7.38                | 296.14           | 297.34           | 0.051008            | 5.82              | 31.09             | 29.09            | 1.80         |
| SanCarlo | 19        | VAR141 | Q500    | 211.00            | 294.00           | 295.73           | 300.00          | 4.27                | 303.00          | 7.27                | 296.32           | 297.65           | 0.050623            | 6.14              | 34.38             | 29.48            | 1.81         |
| SanCarlo | 18        | VAR140 | Q50     | 146.00            | 292.80           | 294.86           | 297.50          | 2.64                | 300.00          | 5.14                | 295.36           | 296.46           | 0.047221            | 5.60              | 26.05             | 24.05            | 1.72         |
| SanCarlo | 18        | VAR140 | Q200    | 181.00            | 292.80           | 295.03           | 297.50          | 2.47                | 300.00          | 4.97                | 295.61           | 296.85           | 0.046112            | 5.98              | 30.28             | 24.89            | 1.73         |
| SanCarlo | 18        | VAR140 | Q500    | 211.00            | 292.80           | 295.16           | 297.50          | 2.34                | 300.00          | 4.84                | 295.80           | 297.16           | 0.045926            | 6.26              | 33.72             | 25.79            | 1.75         |
| SanCarlo | 17        | VAR139 | Q50     | 146.00            | 292.80           | 295.29           | 297.50          | 2.21                | 300.00          | 4.71                | 295.29           | 296.02           | 0.014749            | 3.77              | 38.70             | 26.61            | 1.00         |
| SanCarlo | 17        | VAR139 | Q200    | 181.00            | 292.80           | 295.53           | 297.50          | 1.97                | 300.00          | 4.47                | 295.53           | 296.35           | 0.014280            | 4.02              | 45.00             | 27.33            | 1.00         |
| SanCarlo | 17        | VAR139 | Q500    | 211.00            | 292.80           | 295.72           | 297.50          | 1.78                | 300.00          | 4.28                | 295.72           | 296.61           | 0.013887            | 4.20              | 50.23             | 27.92            | 1.00         |
| SanCarlo | 16        | VAR138 | Q50     | 146.00            | 292.10           | 294.03           | 296.99          | 2.96                | 300.00          | 5.97                | 294.48           | 295.51           | 0.044599            | 5.40              | 27.04             | 25.13            | 1.66         |
| SanCarlo | 16        | VAR138 | Q200    | 181.00            | 292.10           | 294.22           | 296.99          | 2.77                | 300.00          | 5.78                | 294.71           | 295.86           | 0.040979            | 5.68              | 31.86             | 25.66            | 1.63         |
| SanCarlo | 16        | VAR138 | Q500    | 211.00            | 292.10           | 294.37           | 296.99          | 2.62                | 300.00          | 5.63                | 294.90           | 296.14           | 0.038635            | 5.89              | 35.84             | 26.09            | 1.60         |
| SanCarlo | 15        | VAR137 | Q50     | 146.00            | 291.00           | 292.85           | 297.12          | 4.27                | 300.00          | 7.15                | 293.23           | 294.08           | 0.032287            | 4.91              | 29.71             | 25.41            | 1.45         |
| SanCarlo | 15        | VAR137 | Q200    | 181.00            | 291.00           | 293.05           | 297.12          | 4.07                | 300.00          | 6.95                | 293.43           | 294.35           | 0.037218            | 5.05              | 35.87             | 32.88            | 1.54         |
| SanCarlo | 15        | VAR137 | Q500    | 211.00            | 291.00           | 293.14           | 297.12          | 3.98                | 300.00          | 6.86                | 293.58           | 294.65           | 0.039584            | 5.45              | 38.73             | 33.06            | 1.61         |
| SanCarlo | 14        | VAR136 | Q50     | 146.00            | 290.40           | 292.40           | 297.25          | 4.85                | 295.10          | 2.70                | 292.79           | 293.68           | 0.034122            | 4.99              | 29.24             | 25.27            | 1.48         |
| SanCarlo | 14        | VAR136 | Q200    | 181.00            | 290.40           | 292.66           | 297.25          | 4.59                | 295.10          | 2.44                | 293.01           | 293.94           | 0.030820            | 5.02              | 36.06             | 28.67            | 1.43         |
| SanCarlo | 14        | VAR136 | Q500    | 211.00            | 290.40           | 293.79           | 297.25          | 3.46                | 295.10          | 1.31                | 293.19           | 294.25           | 0.005250            | 2.98              | 70.73             | 31.77            | 0.64         |
| SanCarlo | 13.2      | VAR135 | Q50     | 146.00            | 289.40           | 292.74           | 292.70          | -0.04               | 295.00          | 2.26                | 292.10           | 293.14           | 0.005436            | 2.80              | 52.18             | 26.68            | 0.64         |
| SanCarlo | 13.2      | VAR135 | Q200    | 181.00            | 289.40           | 293.30           | 292.70          | -0.60               | 295.00          | 1.70                | 292.39           | 293.67           | 0.003823            | 2.68              | 67.56             | 27.58            | 0.55         |
| SanCarlo | 13.2      | VAR135 | Q500    | 211.00            | 289.40           | 293.75           | 292.70          | -1.05               | 295.00          | 1.25                | 292.62           | 294.11           | 0.003096            | 2.64              | 79.89             | 27.78            | 0.50         |
| SanCarlo | 12        | VAR134 | Q50     | 146.00            | 288.00           | 292.71           | 293.20          | 0.49                | 295.00          | 2.29                | 291.06           | 293.01           | 0.002381            | 2.40              | 60.83             | 17.56            | 0.41         |
| SanCarlo | 12        | VAR134 | Q200    | 181.00            | 288.00           | 293.23           | 293.20          | -0.03               | 295.00          | 1.77                | 291.39           | 293.57           | 0.002439            | 2.59              | 70.01             | 17.72            | 0.42         |

HEC-RAS Plan: SA.rev2 River: Varenna Reach: SanCarlo (Continued)

| Reach    | River Sta  | Profile | Q Total<br>(m3/s) | Min Ch El<br>(m) | W.S. Elev<br>(m) | LOB Elev<br>(m) | L. Freeboard<br>(m) | ROB Elev<br>(m) | R. Freeboard<br>(m) | Crit W.S.<br>(m) | E.G. Elev<br>(m) | E.G. Slope<br>(m/m) | Vel Chnl<br>(m/s) | Flow Area<br>(m2) | Top Width<br>(m) | Froude # Chl |
|----------|------------|---------|-------------------|------------------|------------------|-----------------|---------------------|-----------------|---------------------|------------------|------------------|---------------------|-------------------|-------------------|------------------|--------------|
| SanCarlo | 12 VAR134  | Q500    | 211.00            | 288.00           | 293.64           | 293.20          | -0.44               | 295.00          | 1.36                | 291.66           | 294.02           | 0.002503            | 2.73              | 77.25             | 17.84            | 0.42         |
| SanCarlo | 11 VAR133  | Q50     | 146.00            | 287.00           | 291.55           | 289.34          | -2.21               | 289.64          | -1.90               | 291.55           | 292.80           | 0.040007            | 4.97              | 29.40             | 11.67            | 0.83         |
| SanCarlo | 11 VAR133  | Q200    | 181.00            | 287.00           | 292.01           | 289.34          | -2.67               | 289.64          | -2.36               | 292.01           | 293.36           | 0.036182            | 5.16              | 35.08             | 12.90            | 0.81         |
| SanCarlo | 11 VAR133  | Q500    | 211.00            | 287.00           | 292.32           | 289.34          | -2.98               | 289.64          | -2.67               | 292.32           | 293.80           | 0.034797            | 5.40              | 39.10             | 13.12            | 0.82         |
| SanCarlo | 10 VAR132  | Q50     | 146.00            | 287.20           | 289.14           | 291.00          | 1.86                | 292.00          | 2.86                | 289.98           | 291.98           | 0.065356            | 7.47              | 19.54             | 14.38            | 2.05         |
| SanCarlo | 10 VAR132  | Q200    | 181.00            | 287.20           | 289.37           | 291.00          | 1.63                | 292.00          | 2.63                | 290.32           | 292.57           | 0.062338            | 7.93              | 22.84             | 14.52            | 2.02         |
| SanCarlo | 10 VAR132  | Q500    | 211.00            | 287.20           | 289.56           | 291.00          | 1.44                | 292.00          | 2.44                | 290.59           | 293.02           | 0.059807            | 8.24              | 25.61             | 14.63            | 1.99         |
| SanCarlo | 9 VAR131   | Q50     | 146.00            | 286.15           | 289.89           | 289.70          | -0.19               | 291.00          | 1.11                | 289.89           | 291.00           | 0.015217            | 4.72              | 32.11             | 14.53            | 0.95         |
| SanCarlo | 9 VAR131   | Q200    | 181.00            | 286.15           | 290.45           | 289.70          | -0.75               | 291.00          | 0.55                | 290.27           | 291.53           | 0.012300            | 4.67              | 40.52             | 15.47            | 0.88         |
| SanCarlo | 9 VAR131   | Q500    | 211.00            | 286.15           | 291.03           | 289.70          | -1.33               | 291.00          | -0.03               | 290.56           | 292.00           | 0.009433            | 4.46              | 49.68             | 16.35            | 0.79         |
| SanCarlo | 8 VAR130   | Q50     | 146.00            | 285.55           | 288.96           | 288.80          | -0.16               | 291.00          | 2.04                | 289.13           | 290.48           | 0.022011            | 5.47              | 26.71             | 10.65            | 1.10         |
| SanCarlo | 8 VAR130   | Q200    | 181.00            | 285.55           | 289.54           | 288.80          | -0.74               | 291.00          | 1.46                | 289.54           | 291.08           | 0.018642            | 5.50              | 32.91             | 10.65            | 1.00         |
| SanCarlo | 8 VAR130   | Q500    | 211.00            | 285.55           | 289.87           | 288.80          | -1.07               | 291.00          | 1.13                | 289.87           | 291.58           | 0.019040            | 5.79              | 36.44             | 10.65            | 1.00         |
| SanCarlo | 7 VAR129   | Q50     | 146.00            | 285.70           | 287.97           | 289.30          | 1.33                | 289.70          | 1.73                | 288.51           | 289.90           | 0.033480            | 6.15              | 23.73             | 13.31            | 1.47         |
| SanCarlo | 7 VAR129   | Q200    | 181.00            | 285.70           | 288.21           | 289.30          | 1.09                | 289.70          | 1.49                | 288.87           | 290.50           | 0.035022            | 6.70              | 27.00             | 13.46            | 1.51         |
| SanCarlo | 7 VAR129   | Q500    | 211.00            | 285.70           | 288.42           | 289.30          | 0.88                | 289.70          | 1.28                | 289.16           | 290.98           | 0.035727            | 7.10              | 29.74             | 13.56            | 1.53         |
| SanCarlo | 6.2 VAR128 | Q50     | 146.00            | 285.60           | 287.80           | 290.00          | 2.20                | 289.29          | 1.49                | 288.35           | 289.73           | 0.034055            | 6.15              | 23.73             | 13.51            | 1.48         |
| SanCarlo | 6.2 VAR128 | Q200    | 181.00            | 285.60           | 288.04           | 290.00          | 1.96                | 289.29          | 1.25                | 288.71           | 290.33           | 0.035790            | 6.70              | 27.01             | 13.82            | 1.53         |
| SanCarlo | 6.2 VAR128 | Q500    | 211.00            | 285.60           | 288.23           | 290.00          | 1.77                | 289.29          | 1.06                | 289.00           | 290.80           | 0.036865            | 7.10              | 29.71             | 14.06            | 1.56         |
| SanCarlo | 6.1 VAR128 | Q50     | 146.00            | 285.60           | 288.11           | 290.00          | 1.89                | 289.29          | 1.18                | 288.35           | 289.50           | 0.020990            | 5.22              | 27.99             | 13.91            | 1.17         |
| SanCarlo | 6.1 VAR128 | Q200    | 181.00            | 285.60           | 288.33           | 290.00          | 1.68                | 289.29          | 0.96                | 288.71           | 290.06           | 0.023960            | 5.84              | 31.01             | 14.17            | 1.26         |
| SanCarlo | 6.1 VAR128 | Q500    | 211.00            | 285.60           | 288.46           | 290.00          | 1.54                | 289.29          | 0.83                | 289.00           | 290.55           | 0.027309            | 6.40              | 32.96             | 14.33            | 1.35         |
| SanCarlo | 5 VAR127   | Q50     | 146.00            | 285.60           | 287.94           | 290.00          | 2.06                | 288.00          | 0.06                | 288.33           | 289.36           | 0.033787            | 5.29              | 27.59             | 20.74            | 1.46         |
| SanCarlo | 5 VAR127   | Q200    | 181.00            | 285.60           | 289.28           | 290.00          | 0.72                | 288.00          | -1.28               | 288.60           | 289.79           | 0.005661            | 3.17              | 57.03             | 22.56            | 0.64         |
| SanCarlo | 5 VAR127   | Q500    | 211.00            | 285.60           | 289.74           | 290.00          | 0.26                | 288.00          | -1.74               | 288.80           | 290.24           | 0.004650            | 3.13              | 67.48             | 23.06            | 0.58         |
| SanCarlo | 4 VAR126   | Q50     | 146.00            | 285.15           | 288.73           | 289.50          | 0.77                | 288.00          | -0.73               | 288.17           | 289.18           | 0.005964            | 2.98              | 49.02             | 22.73            | 0.65         |
| SanCarlo | 4 VAR126   | Q200    | 181.00            | 285.15           | 289.30           | 289.50          | 0.20                | 288.00          | -1.30               | 288.43           | 289.73           | 0.004456            | 2.92              | 62.05             | 23.11            | 0.57         |
| SanCarlo | 4 VAR126   | Q500    | 211.00            | 285.15           | 289.75           | 289.50          | -0.25               | 288.00          | -1.75               | 288.63           | 290.18           | 0.003749            | 2.90              | 72.65             | 23.25            | 0.52         |
| SanCarlo | 3 VAR125   | Q50     | 146.00            | 285.00           | 288.73           | 289.55          | 0.82                | 288.00          | -0.73               | 287.92           | 289.11           | 0.004428            | 2.74              | 53.35             | 22.01            | 0.56         |
| SanCarlo | 3 VAR125   | Q200    | 181.00            | 285.00           | 289.29           | 289.55          | 0.26                | 288.00          | -1.29               | 288.20           | 289.67           | 0.003610            | 2.75              | 65.90             | 22.55            | 0.51         |
| SanCarlo | 3 VAR125   | Q500    | 211.00            | 285.00           | 289.75           | 289.55          | -0.20               | 288.00          | -1.75               | 288.40           | 290.14           | 0.003176            | 2.77              | 76.29             | 22.90            | 0.48         |
| SanCarlo | 2 VAR124   | Q50     | 146.00            | 285.00           | 288.75           | 287.00          | -1.75               | 287.00          | -1.75               | 287.52           | 289.05           | 0.002811            | 2.41              | 60.61             | 20.45            | 0.45         |
| SanCarlo | 2 VAR124   | Q200    | 181.00            | 285.00           | 289.30           | 287.00          | -2.30               | 287.00          | -2.30               | 287.78           | 289.63           | 0.002591            | 2.52              | 71.90             | 20.45            | 0.43         |
| SanCarlo | 2 VAR124   | Q500    | 211.00            | 285.00           | 289.75           | 287.00          | -2.75               | 287.00          | -2.75               | 288.00           | 290.09           | 0.002474            | 2.60              | 81.03             | 20.45            | 0.42         |
| SanCarlo | 1.1 VAR123 | Q50     | 146.00            | 285.00           | 288.53           | 287.00          | -1.53               | 286.00          | -2.53               | 287.59           | 289.00           | 0.004813            | 3.04              | 48.05             | 16.30            | 0.56         |
| SanCarlo | 1.1 VAR123 | Q200    | 181.00            | 285.00           | 289.06           | 287.00          | -2.06               | 286.00          | -3.06               | 287.90           | 289.58           | 0.004555            | 3.19              | 56.70             | 16.30            | 0.55         |
| SanCarlo | 1.1 VAR123 | Q500    | 211.00            | 285.00           | 289.48           | 287.00          | -2.48               | 286.00          | -3.48               | 288.15           | 290.04           | 0.004425            | 3.31              | 63.68             | 16.30            | 0.54         |

HEC-RAS Plan: SA.rev2 River: Varenna Reach: SanCarlo (Continued)

| Reach    | River Sta | Profile | Q Total<br>(m3/s) | Min Ch El<br>(m) | W.S. Elev<br>(m) | LOB Elev<br>(m) | L. Freeboard<br>(m) | ROB Elev<br>(m) | R. Freeboard<br>(m) | Crit W.S.<br>(m) | E.G. Elev<br>(m) | E.G. Slope<br>(m/m) | Vel Chnl<br>(m/s) | Flow Area<br>(m2) | Top Width<br>(m) | Froude # Chl |
|----------|-----------|---------|-------------------|------------------|------------------|-----------------|---------------------|-----------------|---------------------|------------------|------------------|---------------------|-------------------|-------------------|------------------|--------------|
| SanCarlo | 1 VAR123  | Q50     | 146.00            | 285.10           | 287.64           | 286.25          | -1.39               | 286.25          | -1.39               | 287.64           | 288.87           | 0.018709            | 4.91              | 29.73             | 12.10            | 1.00         |
| SanCarlo | 1 VAR123  | Q200    | 181.00            | 285.10           | 288.02           | 286.25          | -1.77               | 286.25          | -1.77               | 288.02           | 289.44           | 0.018836            | 5.27              | 34.34             | 12.10            | 1.00         |
| SanCarlo | 1 VAR123  | Q500    | 211.00            | 285.10           | 288.33           | 286.25          | -2.08               | 286.25          | -2.08               | 288.33           | 289.90           | 0.019024            | 5.55              | 38.04             | 12.10            | 1.00         |

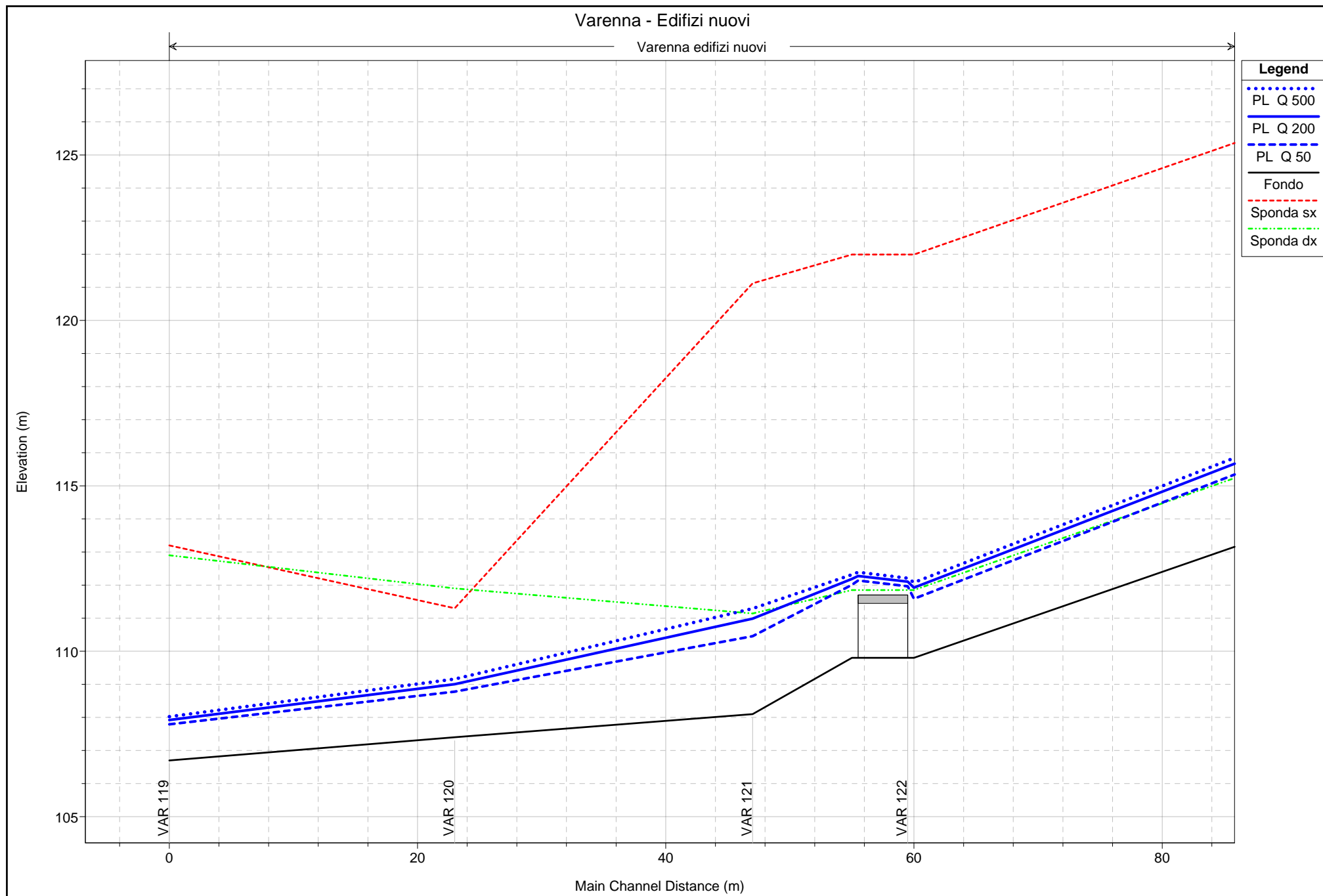
*Piano di Bacino Stralcio del torrente Varenna*  
Verifiche idrauliche

# **Torrente Varenna**

Tratto 2 - dalla sezione VAR122 alla VAR119

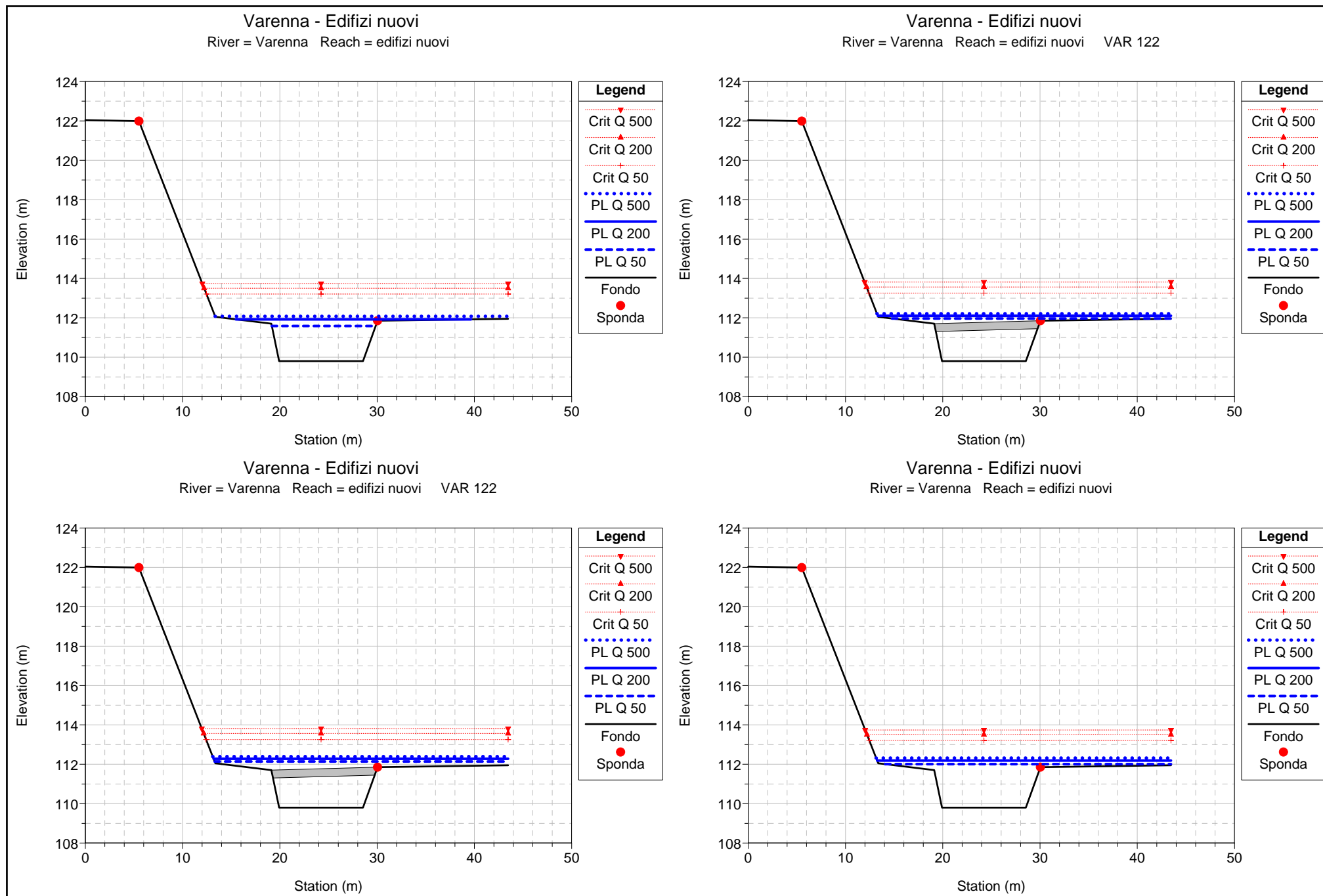
Loc. Edifizi Nuovi

- Profili di corrente
- Sezioni idrauliche
- Tabelle dei risultati

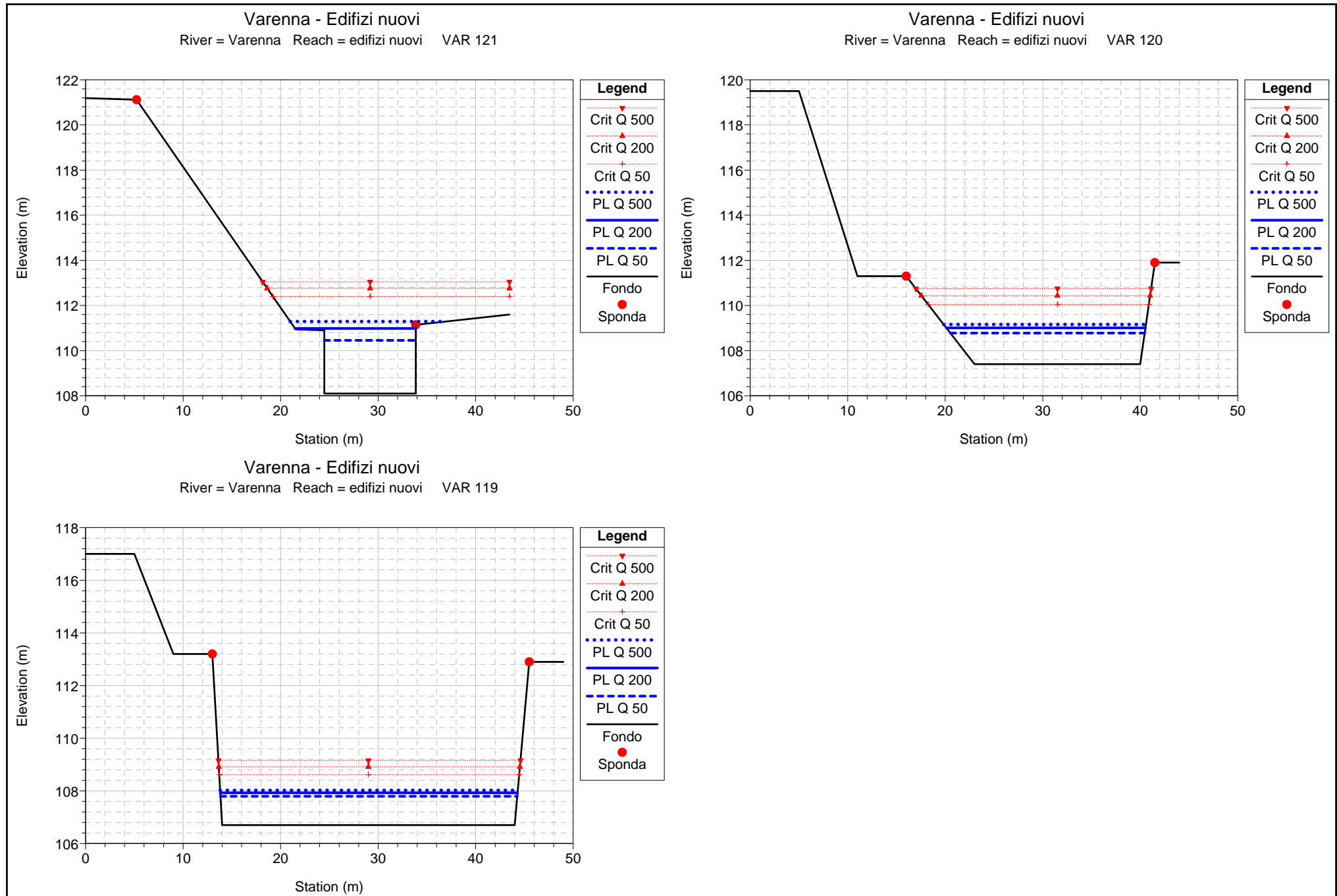


1 cm Horiz. = 4 m 1 cm Vert. = 1.5 m

Approvato con DCP n. 7 del 13/03/2014







HEC-RAS Plan: Rev. 0 River: Varenna Reach: edifizi nuovi

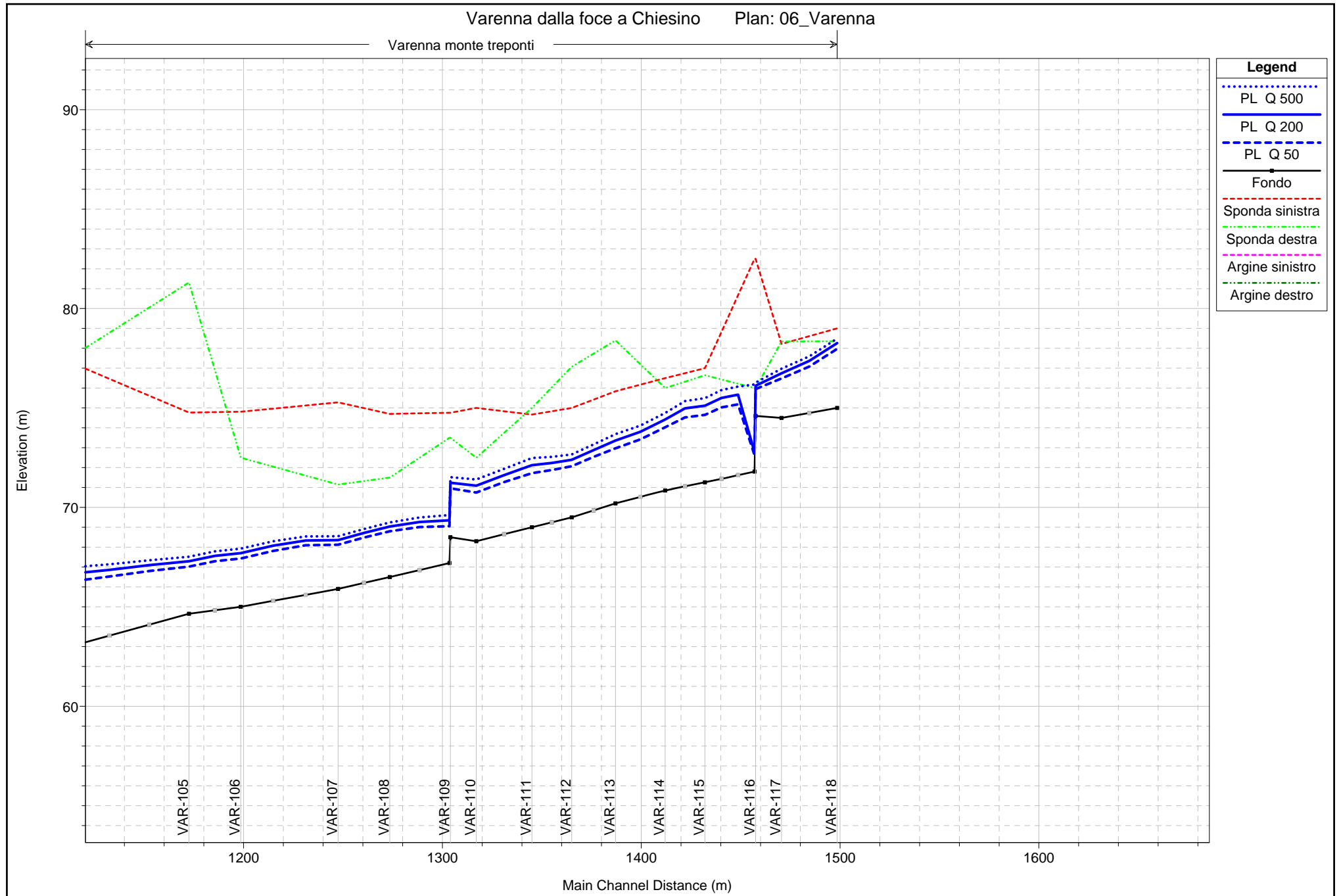
| Reach         | River Sta          | Q Total<br>(m3/s) | Min Ch El<br>(m) | W.S. Elev<br>(m) | LOB Elev<br>(m) | L. Freeboard<br>(m) | ROB Elev<br>(m) | R. Freeboard<br>(m) | Crit W.S.<br>(m) | E.G. Elev<br>(m) | E.G. Slope<br>(m/m) | Vel Chnl<br>(m/s) | Flow Area<br>(m2) | Top Width<br>(m) | Froude # Chl |
|---------------|--------------------|-------------------|------------------|------------------|-----------------|---------------------|-----------------|---------------------|------------------|------------------|---------------------|-------------------|-------------------|------------------|--------------|
| edifizi nuovi | 6 sezione fittizia | 250.00            | 122.80           | 126.13           | 135.04          | 8.91                | 124.95          | -1.18               | 126.13           | 127.07           | 0.015009            | 4.30              | 58.15             | 30.95            | 1.00         |
| edifizi nuovi | 6 sezione fittizia | 311.00            | 122.80           | 126.43           | 135.04          | 8.61                | 124.95          | -1.48               | 126.43           | 127.51           | 0.014515            | 4.61              | 67.47             | 31.19            | 1.00         |
| edifizi nuovi | 6 sezione fittizia | 364.00            | 122.80           | 126.67           | 135.04          | 8.37                | 124.95          | -1.72               | 126.67           | 127.87           | 0.014251            | 4.85              | 75.02             | 31.38            | 1.00         |
| edifizi nuovi | 5                  | 250.00            | 109.80           | 111.59           | 121.99          | 10.40               | 111.85          | 0.26                | 113.21           | 122.30           | 0.225482            | 14.50             | 17.24             | 10.68            | 3.64         |
| edifizi nuovi | 5                  | 311.00            | 109.80           | 111.92           | 121.99          | 10.07               | 111.85          | -0.07               | 113.50           | 122.76           | 0.250306            | 14.60             | 21.62             | 24.17            | 3.86         |
| edifizi nuovi | 5                  | 364.00            | 109.80           | 112.08           | 121.99          | 9.91                | 111.85          | -0.23               | 113.74           | 123.13           | 0.264637            | 14.91             | 26.16             | 30.12            | 3.99         |
| edifizi nuovi | 4.95 VAR 122       | Bridge            |                  |                  |                 |                     |                 |                     |                  |                  |                     |                   |                   |                  |              |
| edifizi nuovi | 4.9                | 250.00            | 109.80           | 112.01           | 121.99          | 9.98                | 111.85          | -0.16               | 113.21           | 118.03           | 0.144539            | 10.94             | 24.00             | 29.39            | 2.94         |
| edifizi nuovi | 4.9                | 311.00            | 109.80           | 112.19           | 121.99          | 9.80                | 111.85          | -0.34               | 113.50           | 118.69           | 0.145648            | 11.56             | 29.39             | 30.21            | 2.99         |
| edifizi nuovi | 4.9                | 364.00            | 109.80           | 112.32           | 121.99          | 9.67                | 111.85          | -0.47               | 113.74           | 119.25           | 0.143860            | 12.07             | 33.35             | 30.31            | 3.00         |
| edifizi nuovi | 4 VAR 121          | 250.00            | 108.10           | 110.46           | 121.12          | 10.66               | 111.14          | 0.68                | 112.39           | 116.97           | 0.112243            | 11.31             | 22.11             | 9.38             | 2.35         |
| edifizi nuovi | 4 VAR 121          | 311.00            | 108.10           | 110.99           | 121.12          | 10.13               | 111.14          | 0.16                | 112.76           | 117.62           | 0.120639            | 11.41             | 27.25             | 12.39            | 2.46         |
| edifizi nuovi | 4 VAR 121          | 364.00            | 108.10           | 111.29           | 121.12          | 9.83                | 111.14          | -0.15               | 113.05           | 118.24           | 0.111783            | 11.69             | 31.35             | 16.03            | 2.40         |
| edifizi nuovi | 3 VAR 120          | 250.00            | 107.40           | 108.78           | 111.30          | 2.52                | 111.90          | 3.12                | 110.05           | 113.69           | 0.121441            | 9.82              | 25.46             | 19.93            | 2.77         |
| edifizi nuovi | 3 VAR 120          | 311.00            | 107.40           | 109.01           | 111.30          | 2.29                | 111.90          | 2.89                | 110.44           | 114.46           | 0.113083            | 10.35             | 30.05             | 20.42            | 2.72         |
| edifizi nuovi | 3 VAR 120          | 364.00            | 107.40           | 109.16           | 111.30          | 2.14                | 111.90          | 2.74                | 110.75           | 115.28           | 0.114210            | 10.96             | 33.21             | 20.74            | 2.77         |
| edifizi nuovi | 2 VAR 119          | 250.00            | 106.70           | 107.79           | 113.20          | 5.41                | 112.90          | 5.11                | 108.61           | 110.72           | 0.088995            | 7.58              | 33.00             | 30.43            | 2.32         |
| edifizi nuovi | 2 VAR 119          | 311.00            | 106.70           | 107.92           | 113.20          | 5.28                | 112.90          | 4.98                | 108.91           | 111.53           | 0.095256            | 8.41              | 36.98             | 30.48            | 2.44         |
| edifizi nuovi | 2 VAR 119          | 364.00            | 106.70           | 108.02           | 113.20          | 5.18                | 112.90          | 4.88                | 109.16           | 112.24           | 0.101229            | 9.10              | 40.00             | 30.52            | 2.54         |

*Piano di Bacino Stralcio del torrente Varenna*  
Verifiche idrauliche

## **Torrente Varenna**

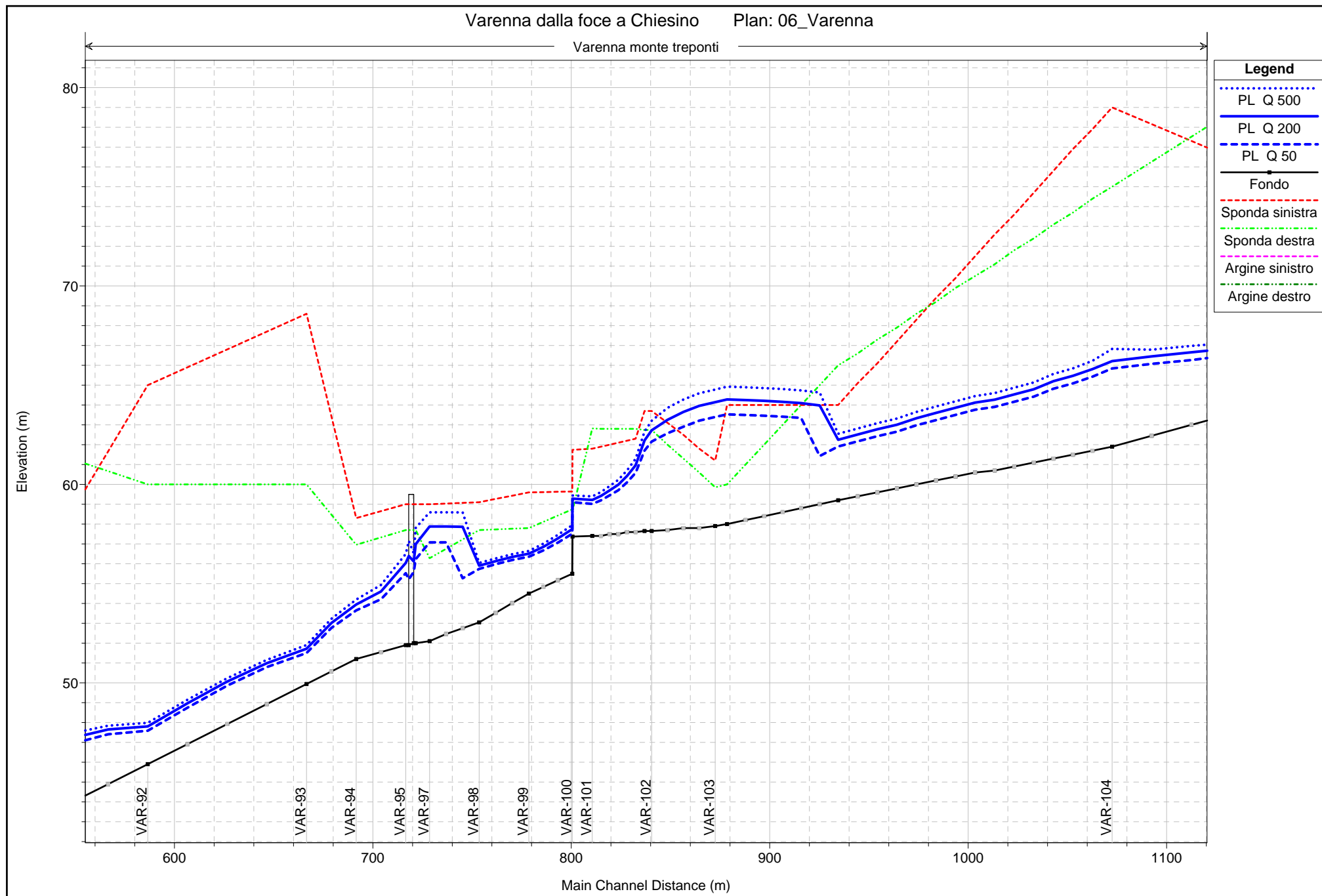
Tratto 3 - dalla sezione VAR118 alla VAR66  
da loc. Chiesino alla confl. con il Cantalupo

- Profili di corrente
- Sezioni idrauliche
- Tabelle dei risultati



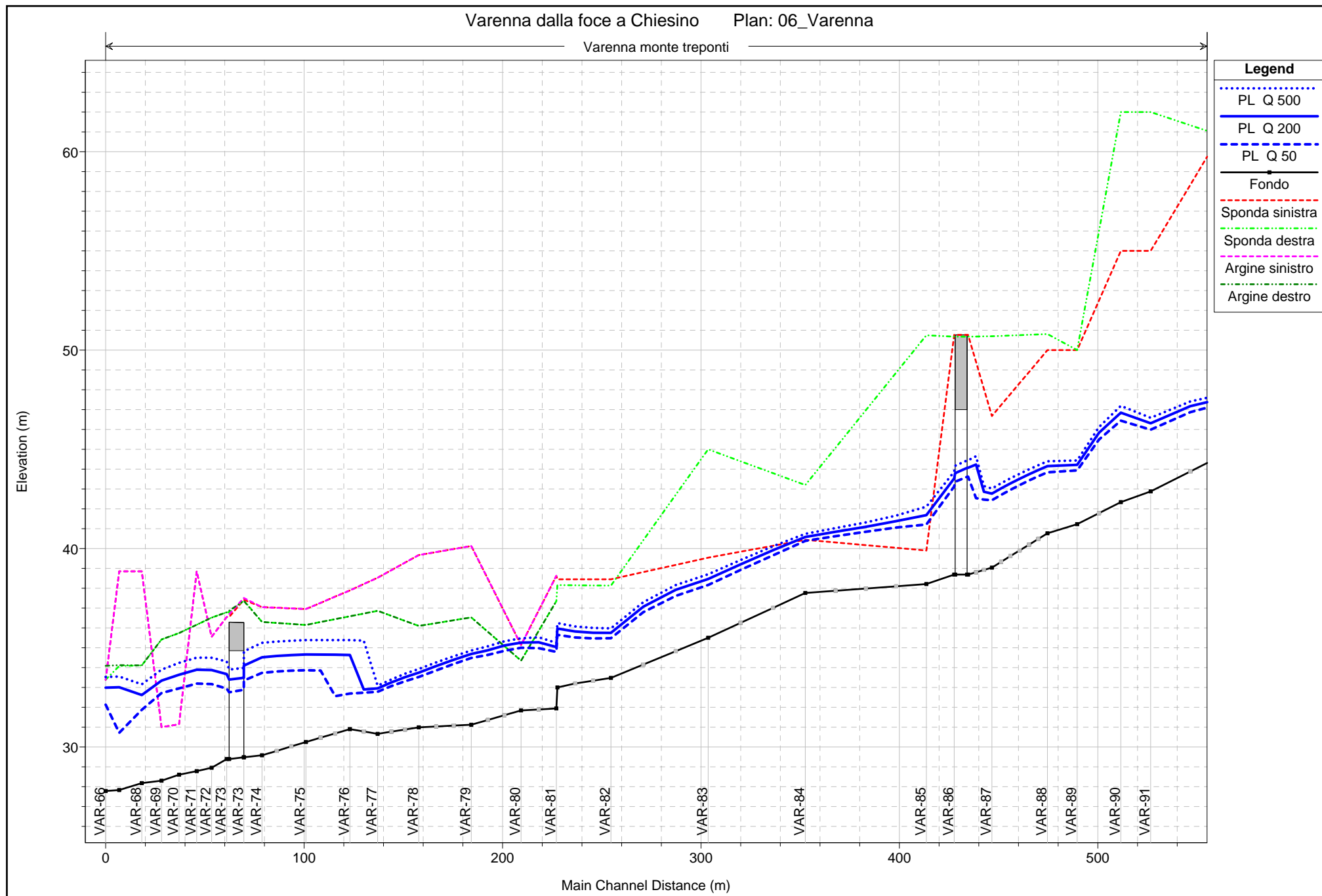
1 cm Horiz. = 25 m 1 cm Vert. = 2.5 m

Approvato con DCP n. 7 del 13/03/2014

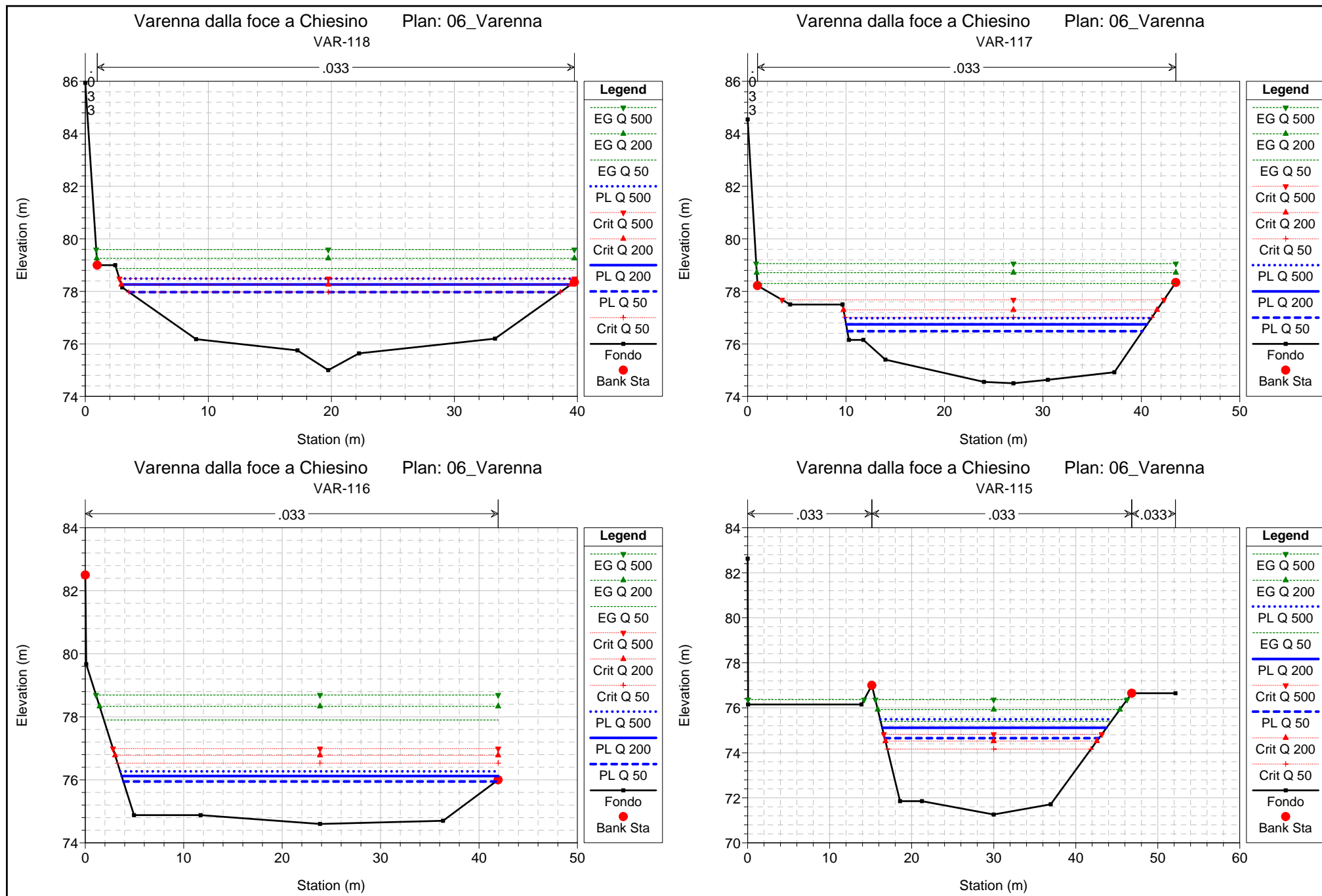


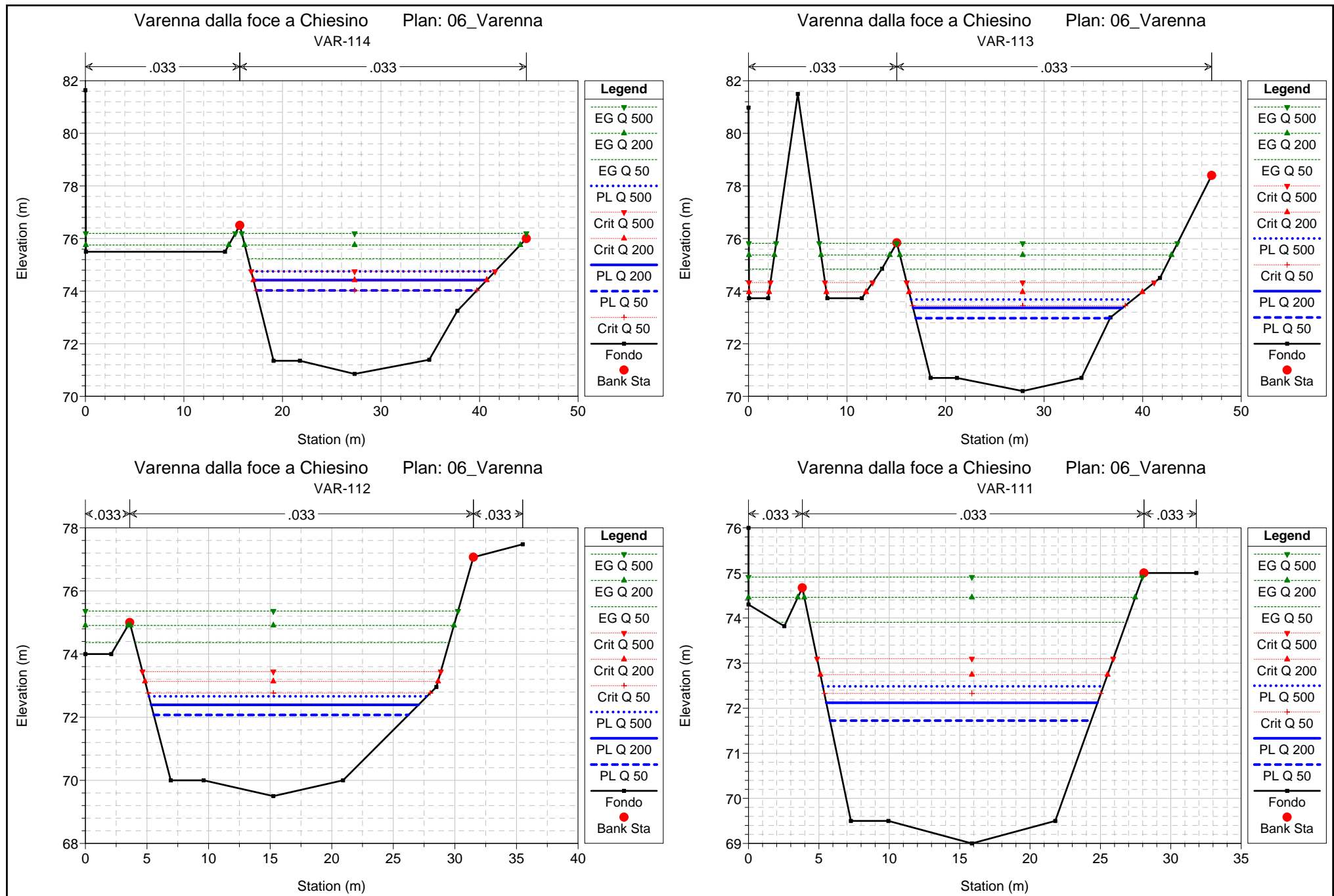
1 cm Horiz. = 25 m    1 cm Vert. = 2.5 m

Approvato con DCP n. 7 del 13/03/2014

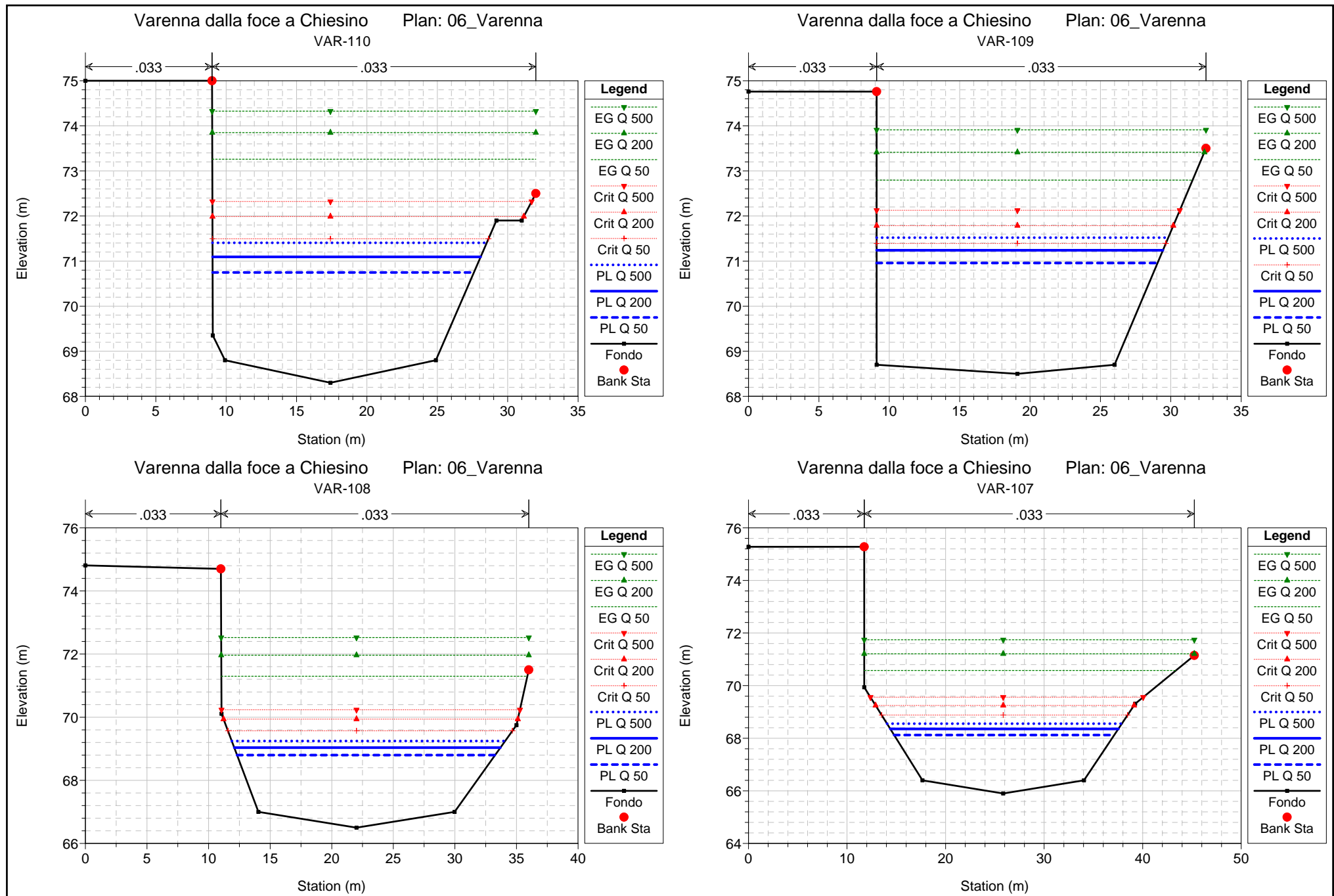


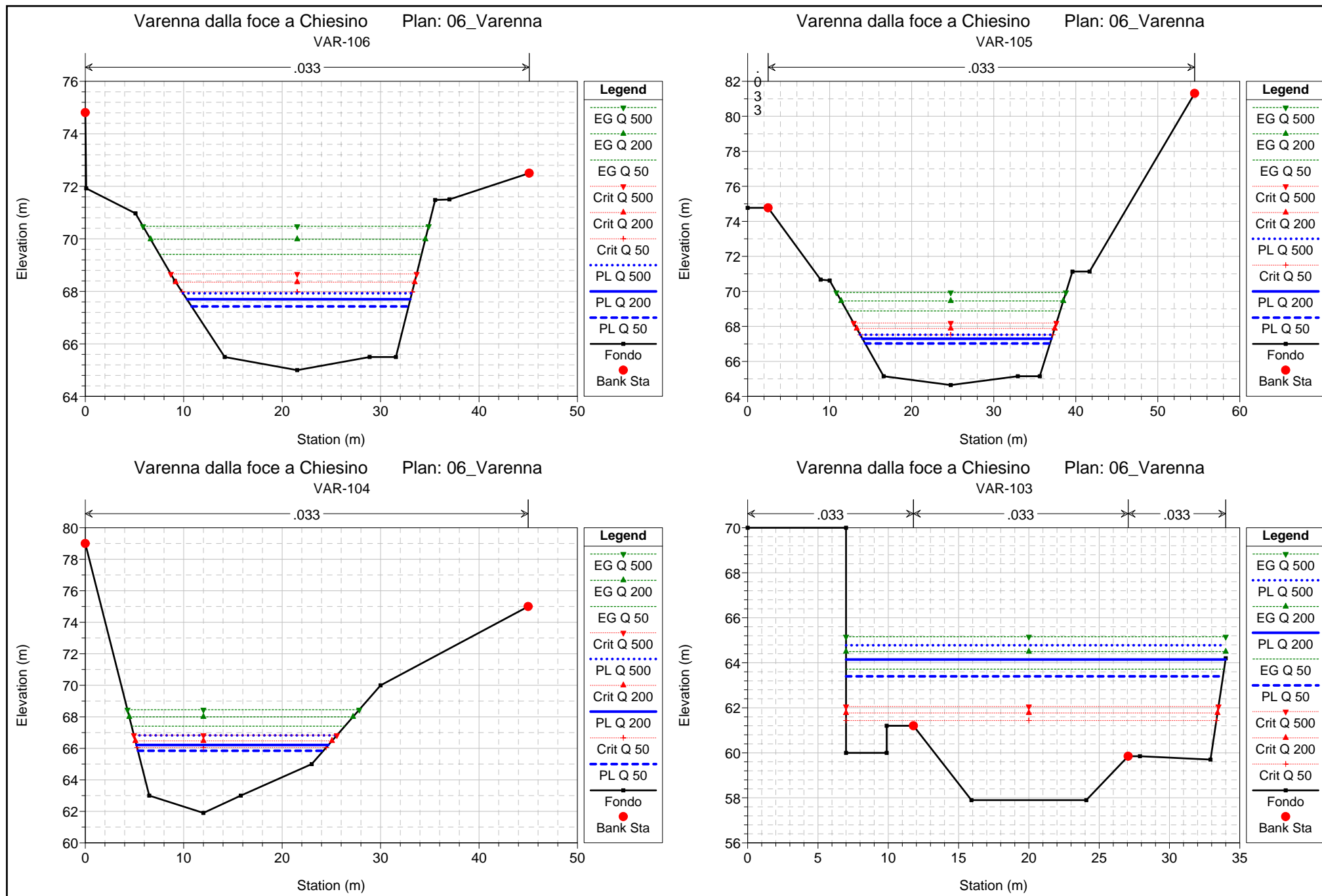
1 cm Horiz. = 25 m    1 cm Vert. = 2.5 m

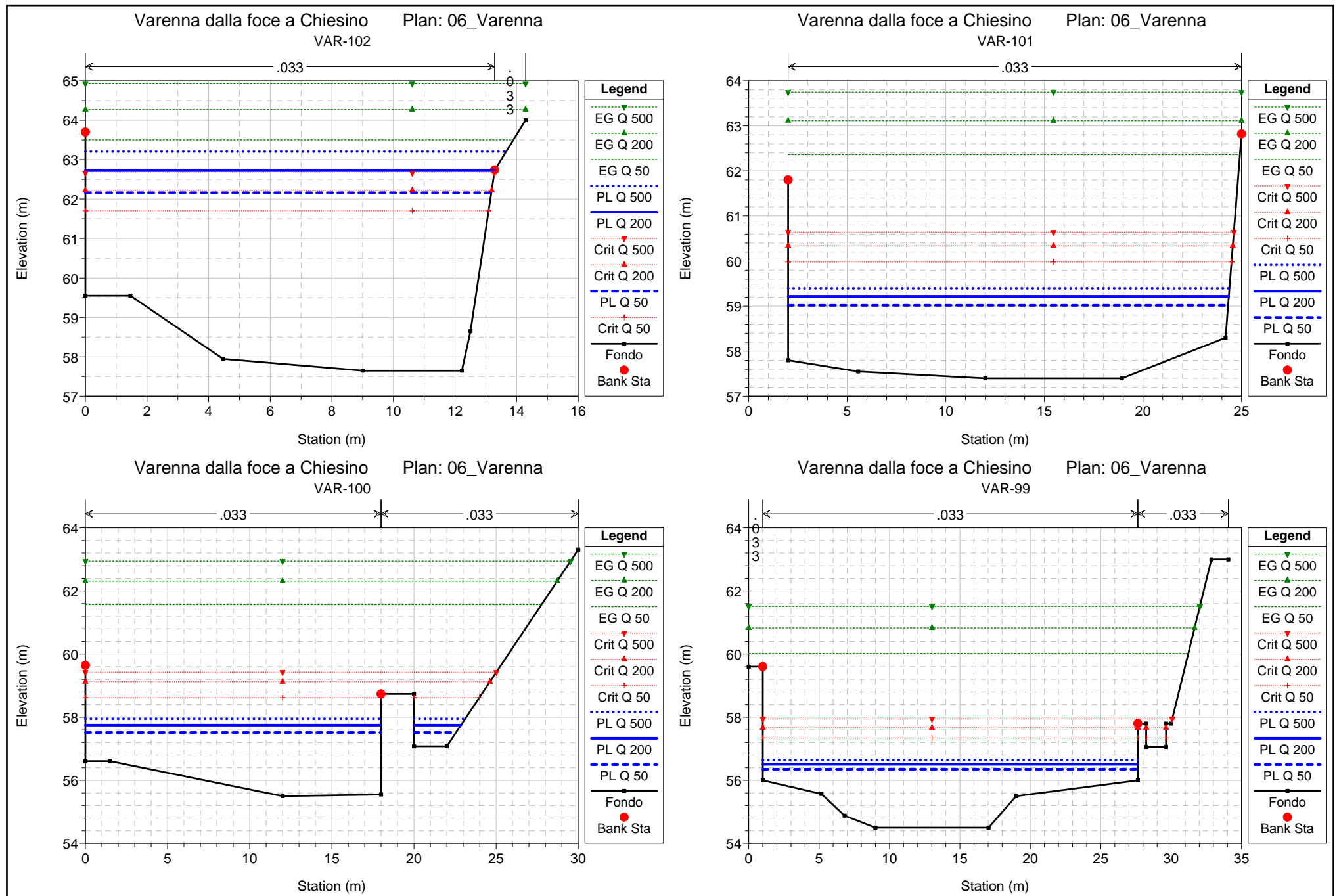


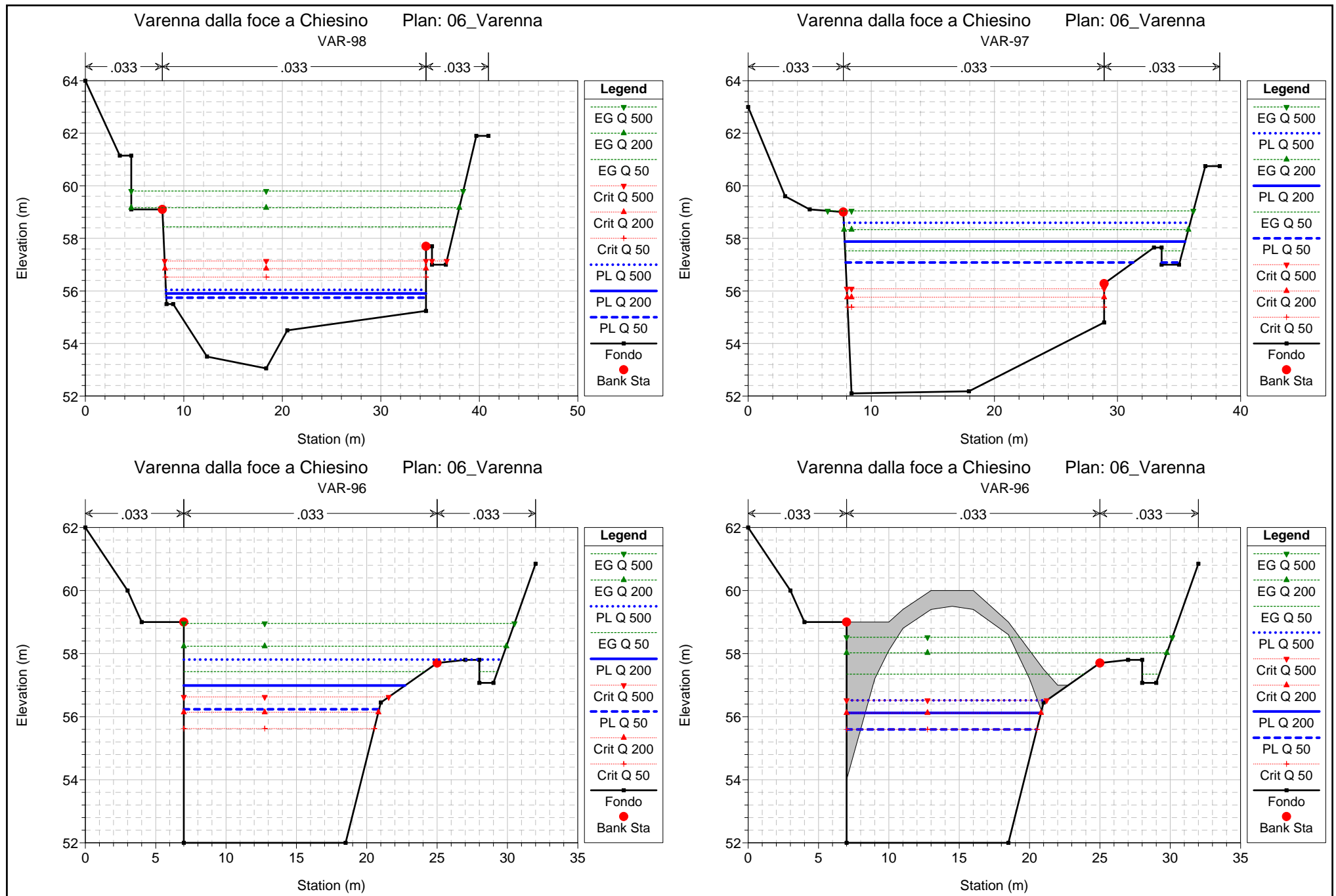


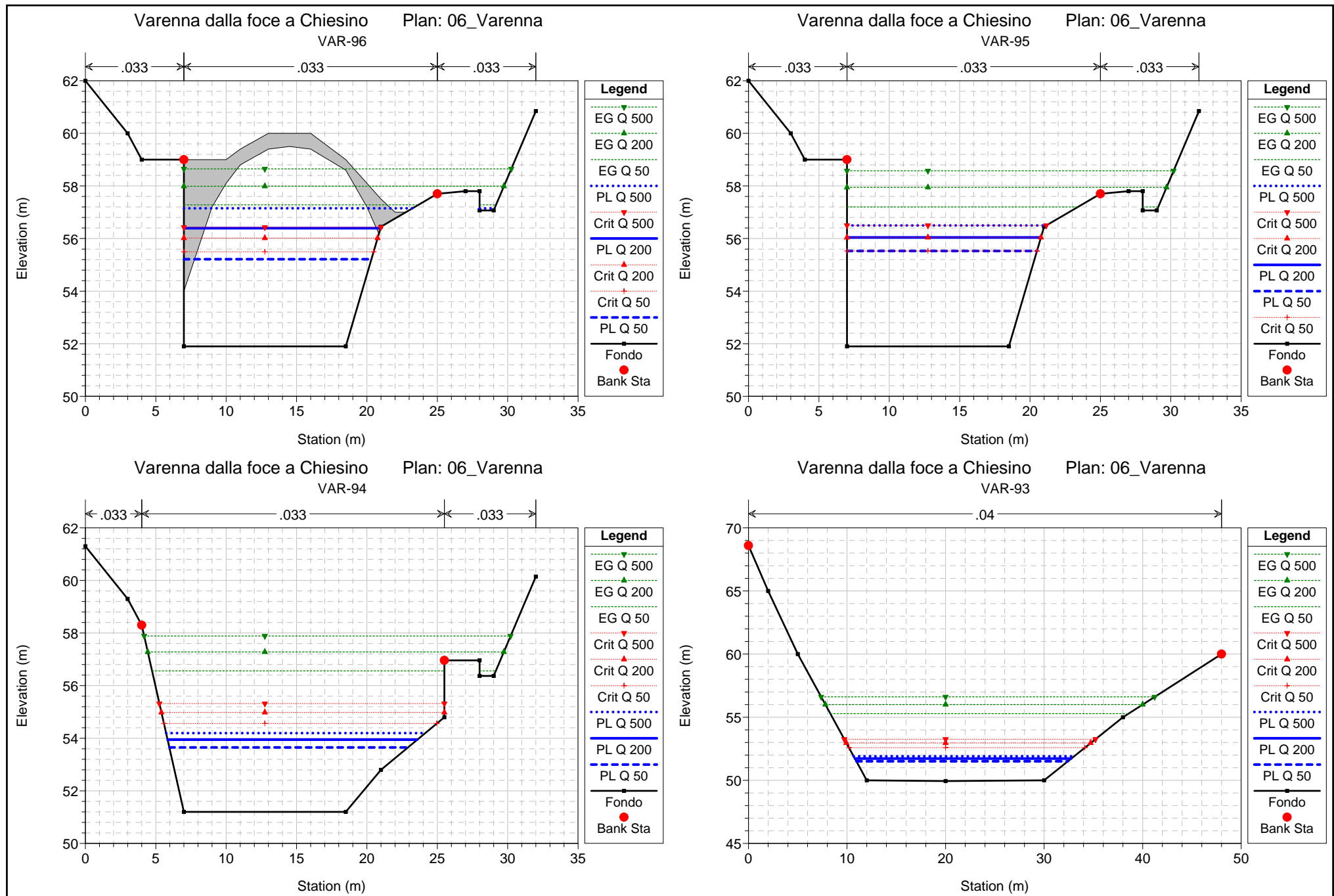


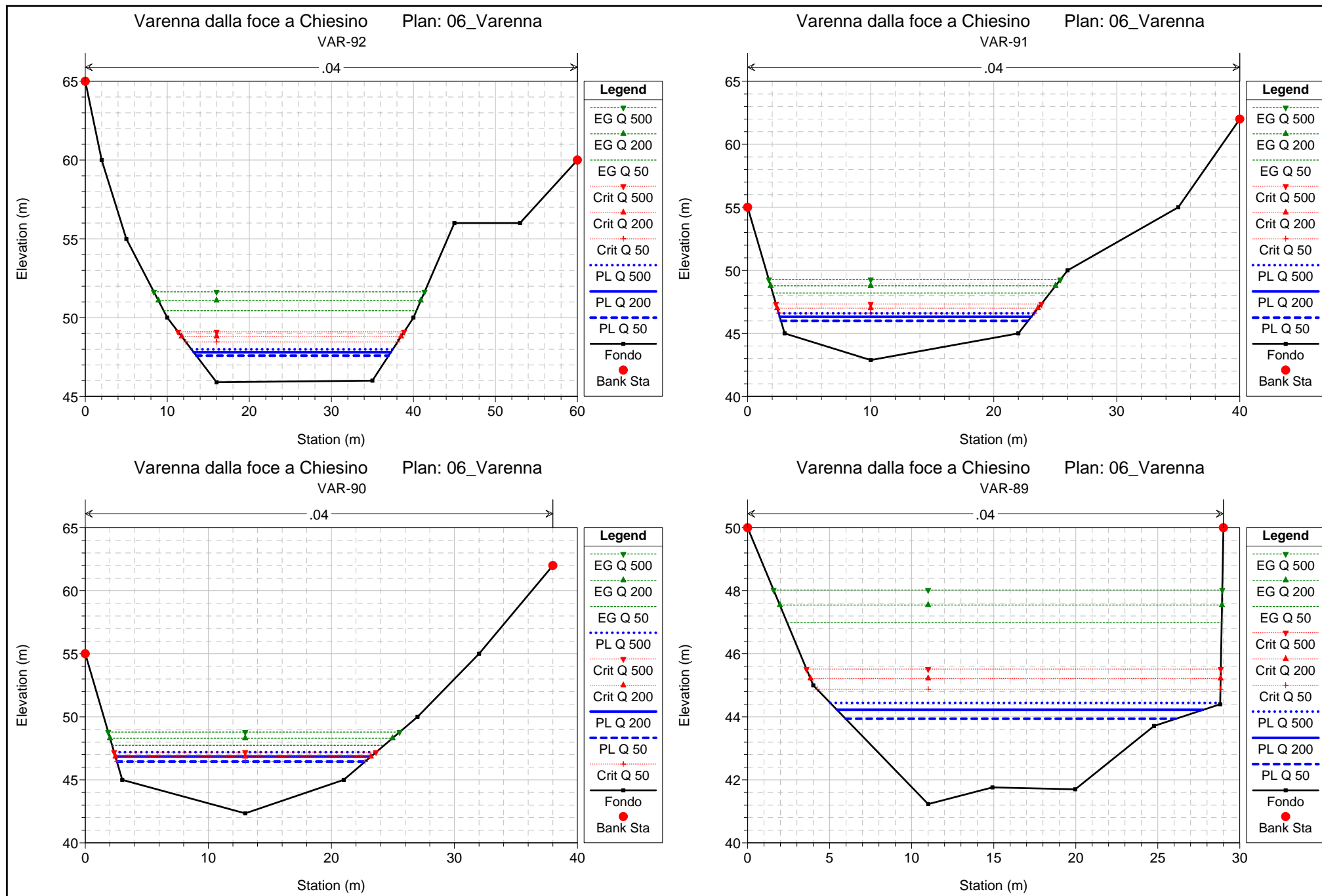


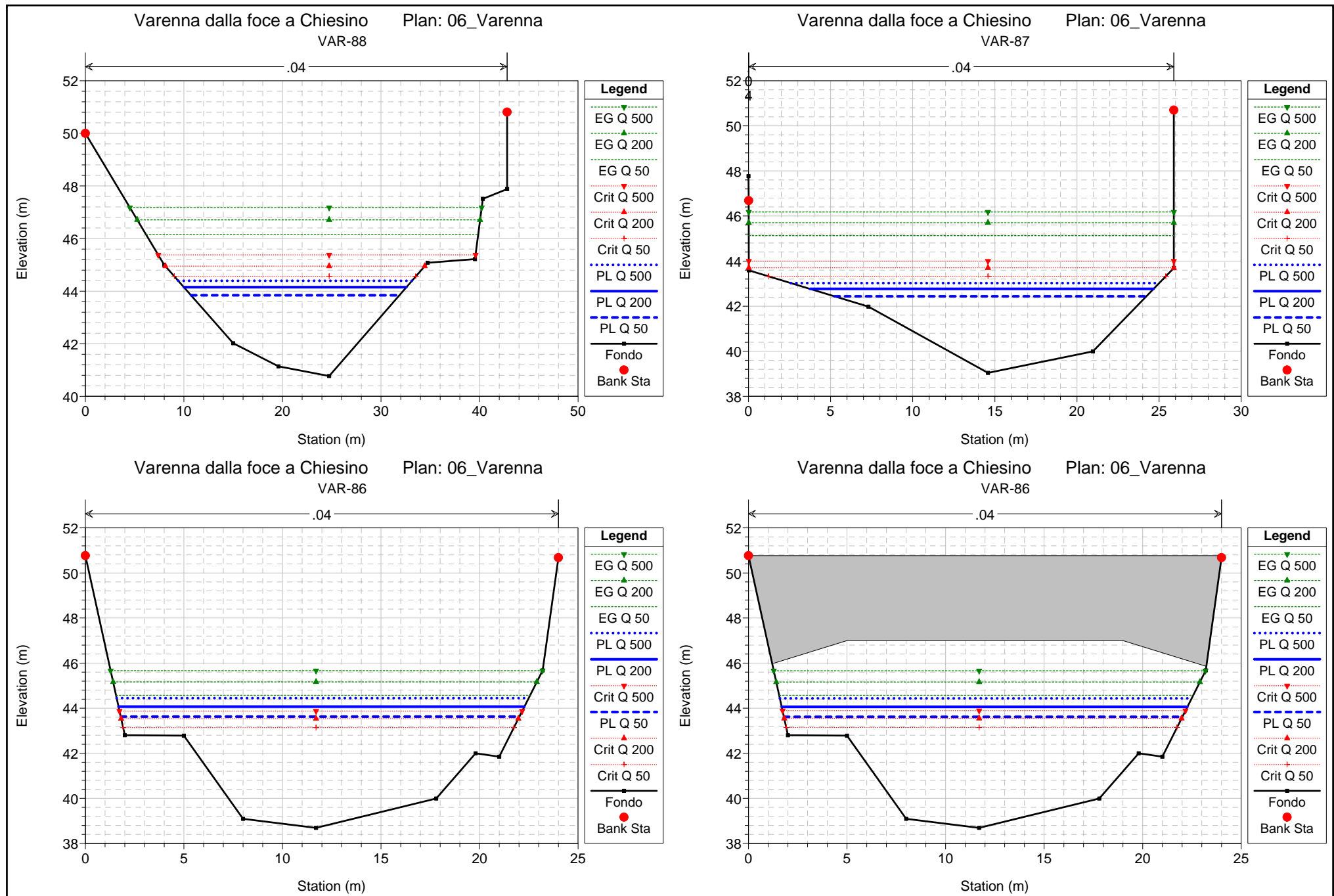


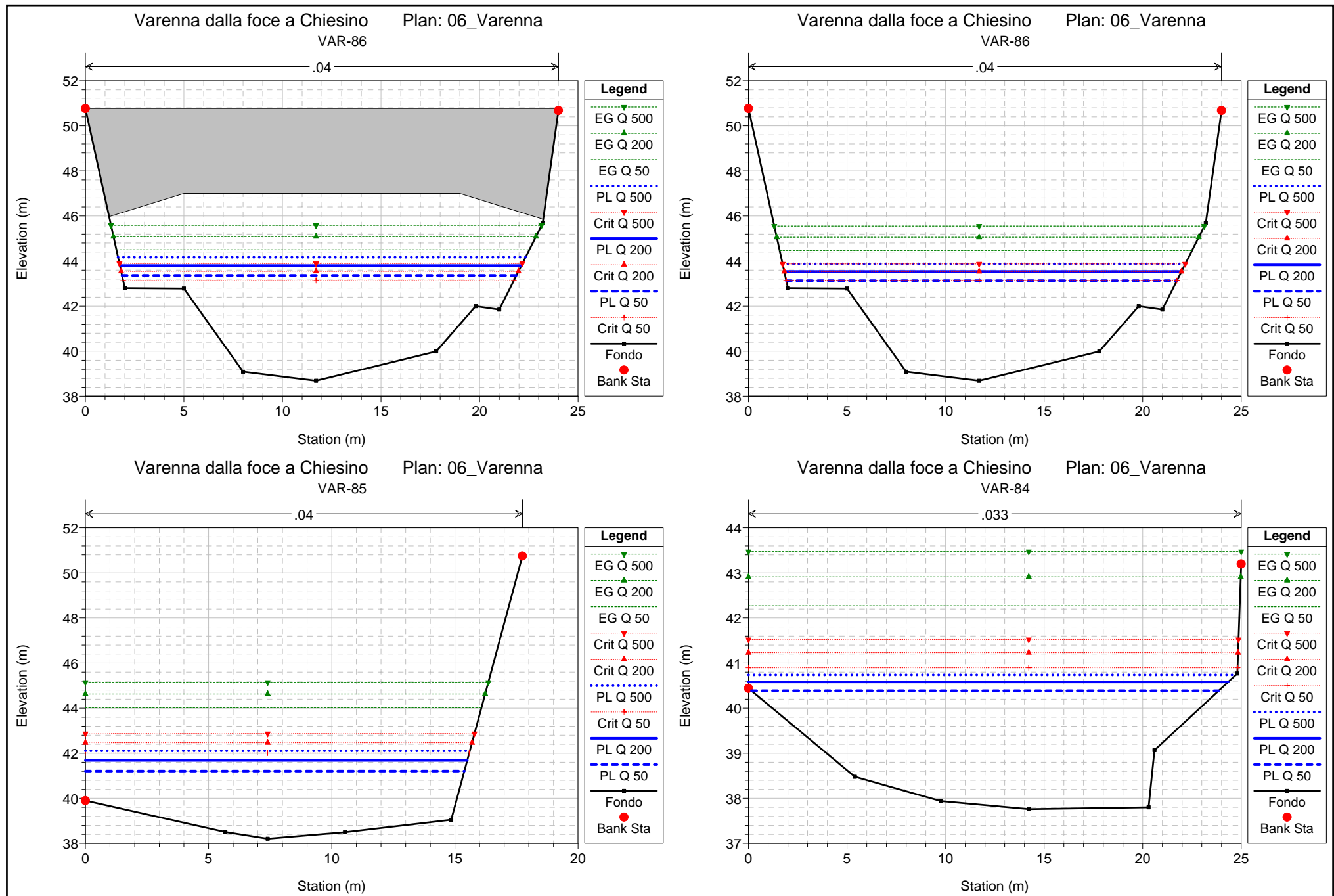




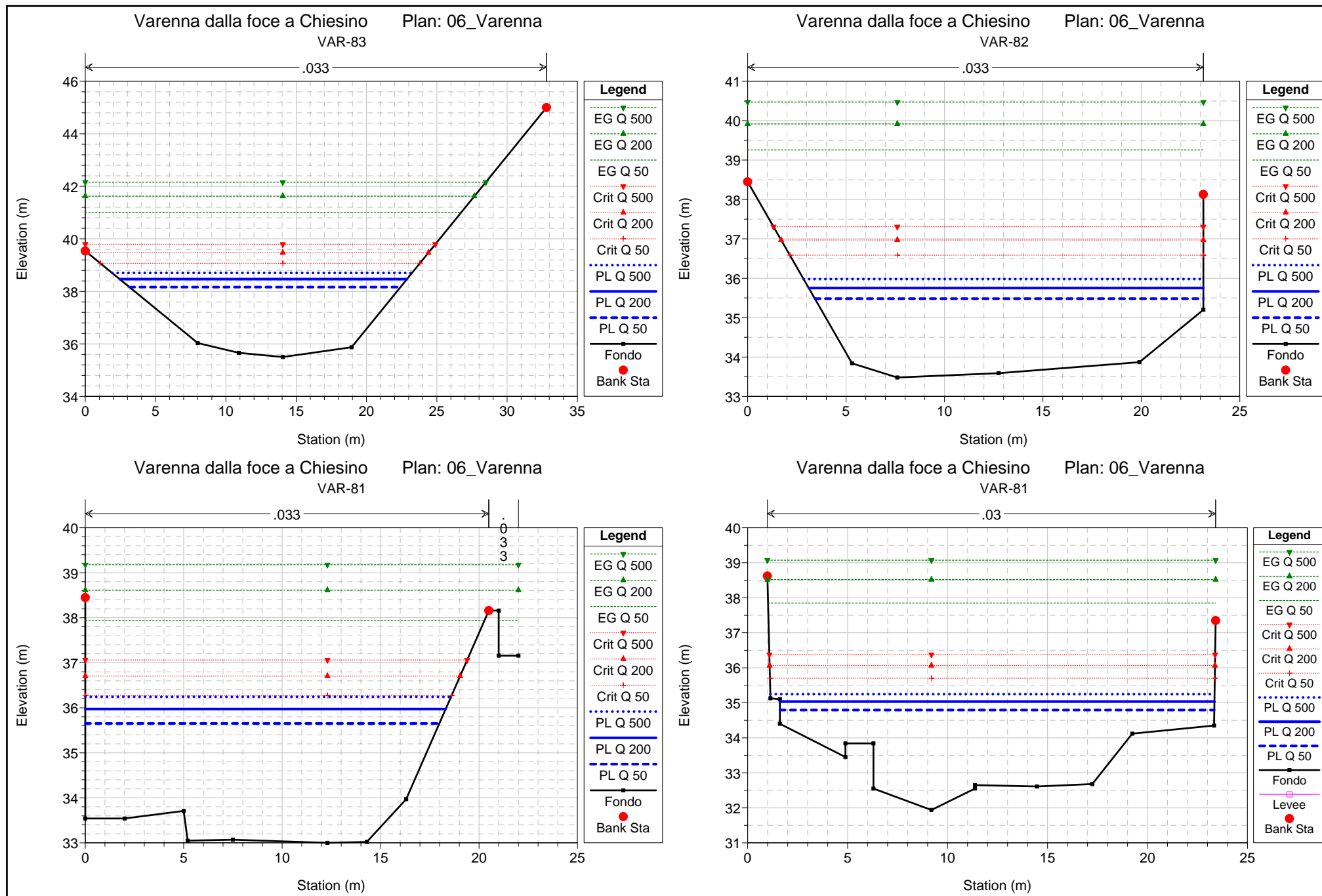


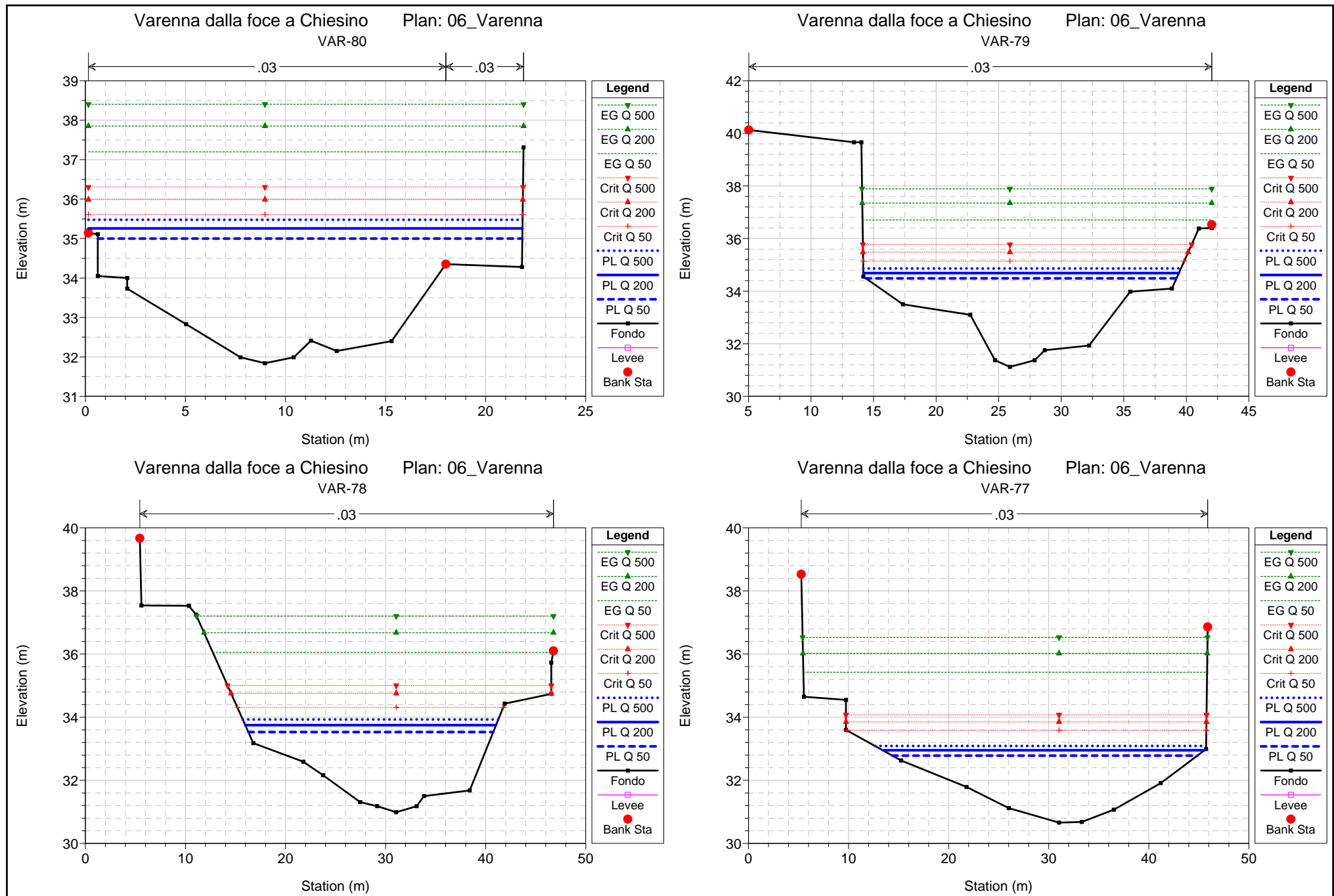


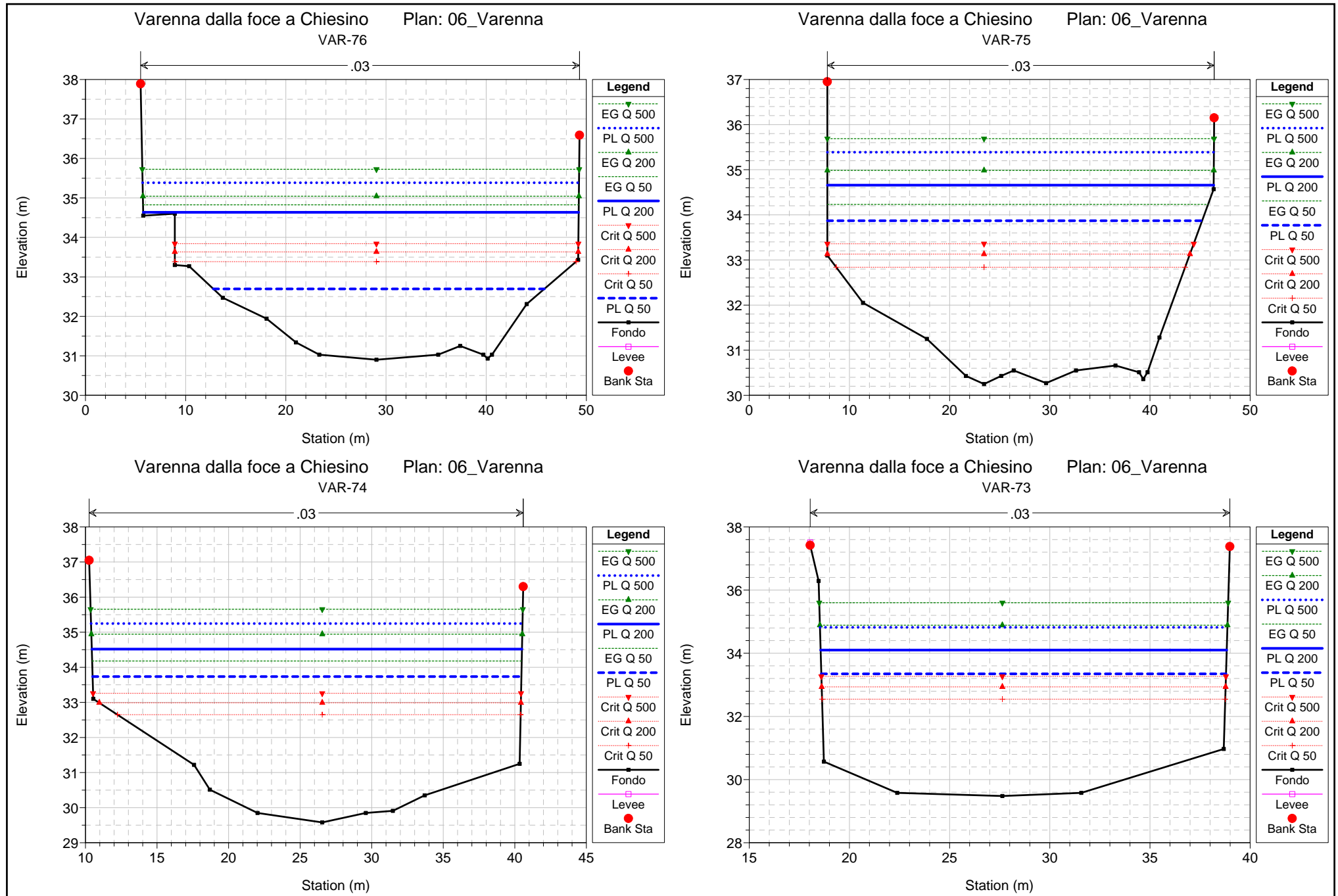


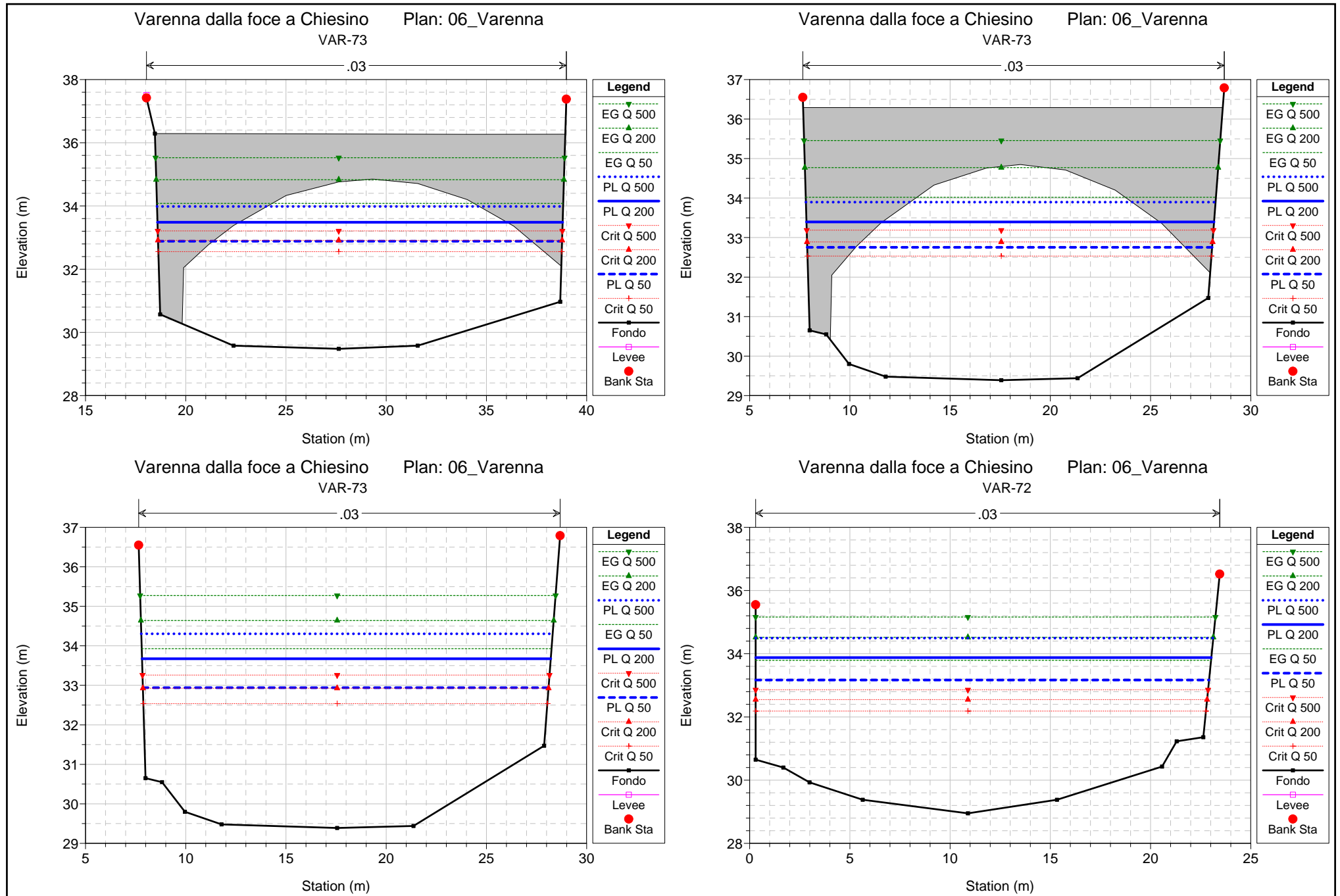


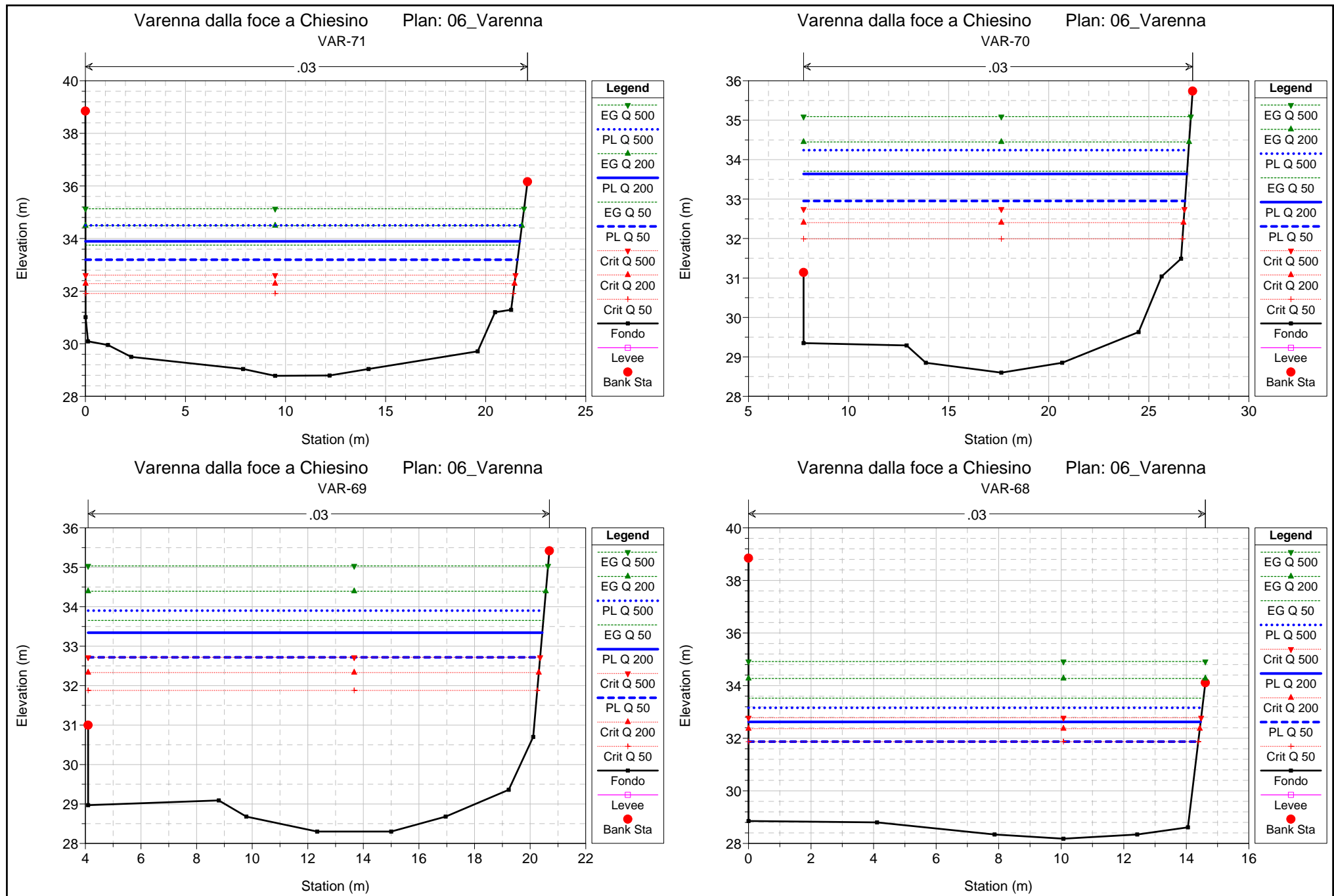


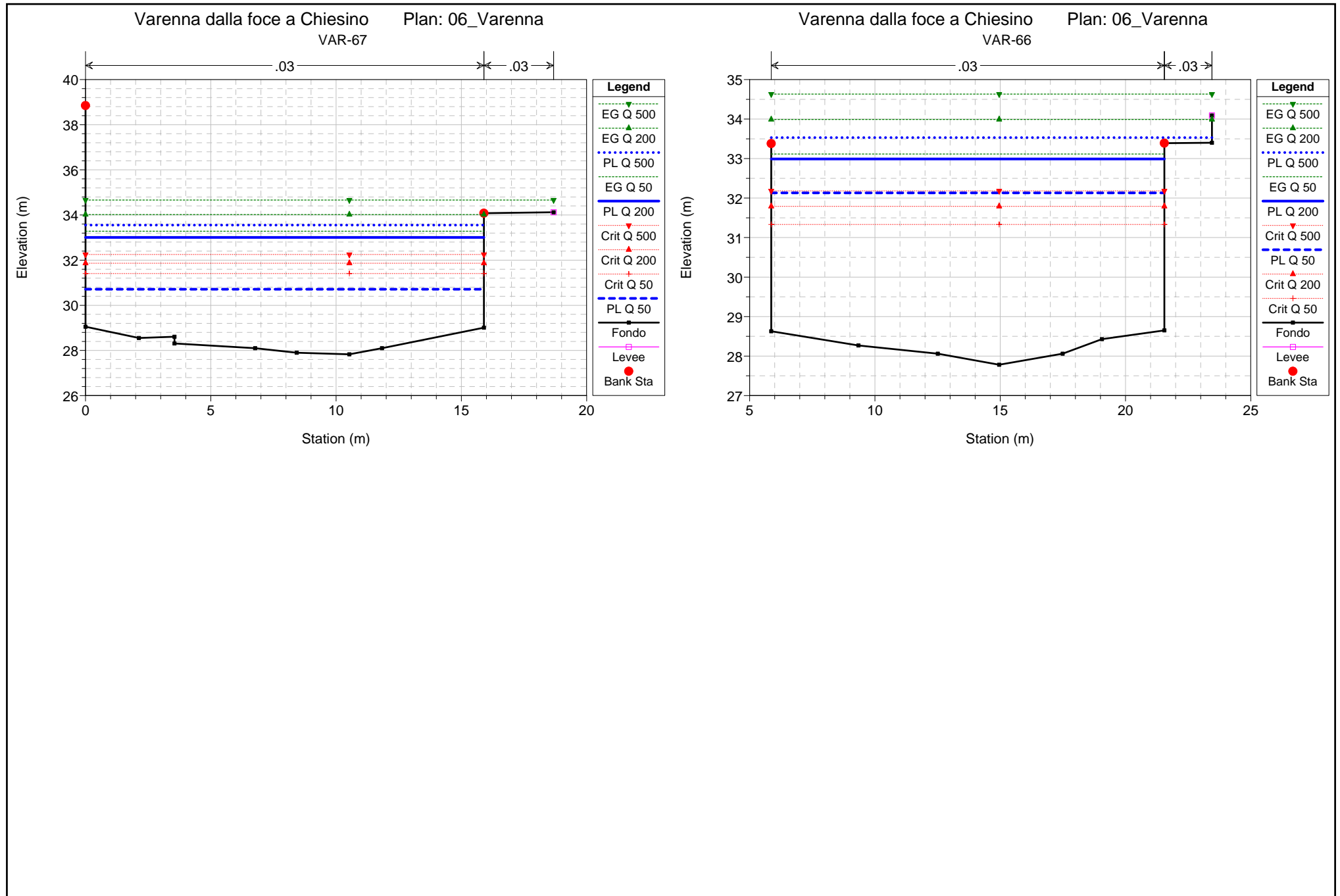












HEC-RAS Plan: 06\_Varenna River: Varenna Reach: monte treponti

| Reach          | River Sta      | Profile | Q Total<br>(m3/s) | Min Ch El<br>(m) | W.S. Elev<br>(m) | LOB Elev<br>(m) | L. Freeboard<br>(m) | ROB Elev<br>(m) | R. Freeboard<br>(m) | Crit W.S.<br>(m) | E.G. Elev<br>(m) | E.G. Slope<br>(m/m) | Vel Chnl<br>(m/s) | Flow Area<br>(m2) | Top Width<br>(m) | Froude # Chl |
|----------------|----------------|---------|-------------------|------------------|------------------|-----------------|---------------------|-----------------|---------------------|------------------|------------------|---------------------|-------------------|-------------------|------------------|--------------|
| monte treponti | 3195.4 VAR-118 | Q 50    | 260.00            | 75.00            | 77.97            | 79.00           | 1.03                | 78.35           | 0.38                | 77.97            | 78.87            | 0.009270            | 4.20              | 61.92             | 35.07            | 1.01         |
| monte treponti | 3195.4 VAR-118 | Q 200   | 320.00            | 75.00            | 78.26            | 79.00           | 0.74                | 78.35           | 0.09                | 78.26            | 79.26            | 0.008867            | 4.42              | 72.34             | 36.56            | 1.00         |
| monte treponti | 3195.4 VAR-118 | Q 500   | 375.00            | 75.00            | 78.49            | 79.00           | 0.51                | 78.35           | -0.14               | 78.49            | 79.59            | 0.008681            | 4.65              | 80.66             | 36.98            | 1.00         |
| monte treponti | 3167.4 VAR-117 | Q 50    | 260.00            | 74.50            | 76.48            | 78.22           | 1.74                | 78.34           | 1.86                | 77.01            | 78.30            | 0.024431            | 5.97              | 43.54             | 29.99            | 1.58         |
| monte treponti | 3167.4 VAR-117 | Q 200   | 320.00            | 74.50            | 76.74            | 78.22           | 1.48                | 78.34           | 1.60                | 77.30            | 78.71            | 0.021979            | 6.22              | 51.46             | 30.59            | 1.53         |
| monte treponti | 3167.4 VAR-117 | Q 500   | 375.00            | 74.50            | 76.98            | 78.22           | 1.24                | 78.34           | 1.36                | 77.68            | 79.06            | 0.020112            | 6.39              | 58.67             | 31.12            | 1.49         |
| monte treponti | 3154.4 VAR-116 | Q 50    | 260.00            | 74.60            | 75.95            | 82.50           | 6.55                | 76.00           | 0.05                | 76.53            | 77.90            | 0.037086            | 6.19              | 42.00             | 37.85            | 1.88         |
| monte treponti | 3154.4 VAR-116 | Q 200   | 320.00            | 74.60            | 76.12            | 82.50           | 6.38                | 76.00           | -0.12               | 76.78            | 78.33            | 0.035414            | 6.59              | 48.53             | 38.25            | 1.87         |
| monte treponti | 3154.4 VAR-116 | Q 500   | 375.00            | 74.60            | 76.27            | 82.50           | 6.23                | 76.00           | -0.27               | 76.99            | 78.69            | 0.033700            | 6.90              | 54.38             | 38.41            | 1.85         |
| monte treponti | 3153.9         | Q 50    | 260.00            | 71.80            | 72.62            | 82.50           | 9.88                | 76.00           | 3.38                | 73.67            | 77.57            | 0.146663            | 9.85              | 26.39             | 33.00            | 3.52         |
| monte treponti | 3153.9         | Q 200   | 320.00            | 71.80            | 72.78            | 82.50           | 9.72                | 76.00           | 3.22                | 73.94            | 78.00            | 0.124016            | 10.13             | 31.60             | 33.30            | 3.32         |
| monte treponti | 3153.9         | Q 500   | 375.00            | 71.80            | 76.18            | 82.50           | 6.32                | 76.00           | -0.18               | 74.17            | 76.47            | 0.001149            | 2.40              | 156.22            | 39.70            | 0.39         |
| monte treponti | 3128.9 VAR-115 | Q 50    | 260.00            | 71.26            | 74.65            | 77.00           | 2.35                | 76.65           | 2.00                | 74.16            | 75.40            | 0.004999            | 3.83              | 67.83             | 26.12            | 0.76         |
| monte treponti | 3128.9 VAR-115 | Q 200   | 320.00            | 71.26            | 75.11            | 77.00           | 1.89                | 76.65           | 1.54                | 74.52            | 75.92            | 0.004659            | 3.99              | 80.20             | 27.35            | 0.74         |
| monte treponti | 3128.9 VAR-115 | Q 500   | 375.00            | 71.26            | 75.49            | 77.00           | 1.51                | 76.65           | 1.16                | 74.82            | 76.36            | 0.004482            | 4.13              | 90.78             | 28.36            | 0.74         |
| monte treponti | 3108.9 VAR-114 | Q 50    | 260.00            | 70.85            | 74.03            | 76.50           | 2.47                | 76.00           | 1.97                | 74.03            | 75.23            | 0.009161            | 4.87              | 53.43             | 22.41            | 1.01         |
| monte treponti | 3108.9 VAR-114 | Q 200   | 320.00            | 70.85            | 74.42            | 76.50           | 2.08                | 76.00           | 1.58                | 74.42            | 75.76            | 0.008930            | 5.12              | 62.49             | 23.67            | 1.01         |
| monte treponti | 3108.9 VAR-114 | Q 500   | 375.00            | 70.85            | 74.75            | 76.50           | 1.75                | 76.00           | 1.25                | 74.75            | 76.19            | 0.008757            | 5.32              | 70.49             | 24.73            | 1.01         |
| monte treponti | 3083.9 VAR-113 | Q 50    | 260.00            | 70.20            | 72.97            | 75.84           | 2.87                | 78.40           | 5.43                | 73.45            | 74.84            | 0.016143            | 6.06              | 42.93             | 19.73            | 1.31         |
| monte treponti | 3083.9 VAR-113 | Q 200   | 320.00            | 70.20            | 73.36            | 75.84           | 2.48                | 78.40           | 5.04                | 73.97            | 75.37            | 0.015371            | 6.28              | 50.93             | 21.24            | 1.30         |
| monte treponti | 3083.9 VAR-113 | Q 500   | 375.00            | 70.20            | 73.68            | 75.84           | 2.16                | 78.40           | 4.72                | 74.33            | 75.82            | 0.014918            | 6.47              | 57.93             | 22.52            | 1.29         |
| monte treponti | 3061.9 VAR-112 | Q 50    | 260.00            | 69.50            | 72.07            | 75.00           | 2.93                | 77.07           | 5.00                | 72.77            | 74.37            | 0.023353            | 6.71              | 38.75             | 20.68            | 1.56         |
| monte treponti | 3061.9 VAR-112 | Q 200   | 320.00            | 69.50            | 72.39            | 75.00           | 2.61                | 77.07           | 4.68                | 73.14            | 74.91            | 0.022246            | 7.03              | 45.54             | 21.71            | 1.55         |
| monte treponti | 3061.9 VAR-112 | Q 500   | 375.00            | 69.50            | 72.66            | 75.00           | 2.34                | 77.07           | 4.41                | 73.44            | 75.36            | 0.021497            | 7.28              | 51.50             | 22.58            | 1.54         |
| monte treponti | 3041.9 VAR-111 | Q 50    | 260.00            | 69.00            | 71.72            | 74.67           | 2.95                | 75.00           | 3.28                | 72.33            | 73.91            | 0.019447            | 6.54              | 39.73             | 18.55            | 1.43         |
| monte treponti | 3041.9 VAR-111 | Q 200   | 320.00            | 69.00            | 72.12            | 74.67           | 2.55                | 75.00           | 2.88                | 72.74            | 74.46            | 0.017687            | 6.77              | 47.26             | 19.27            | 1.38         |
| monte treponti | 3041.9 VAR-111 | Q 500   | 375.00            | 69.00            | 72.49            | 74.67           | 2.18                | 75.00           | 2.51                | 73.10            | 74.91            | 0.016142            | 6.90              | 54.38             | 19.93            | 1.33         |
| monte treponti | 3013.9 VAR-110 | Q 50    | 260.00            | 68.30            | 70.75            | 75.00           | 4.25                | 72.50           | 1.75                | 71.49            | 73.26            | 0.024838            | 7.02              | 37.03             | 18.57            | 1.59         |
| monte treponti | 3013.9 VAR-110 | Q 200   | 320.00            | 68.30            | 71.09            | 75.00           | 3.91                | 72.50           | 1.41                | 71.99            | 73.85            | 0.023316            | 7.36              | 43.50             | 19.05            | 1.55         |
| monte treponti | 3013.9 VAR-110 | Q 500   | 375.00            | 68.30            | 71.41            | 75.00           | 3.59                | 72.50           | 1.09                | 72.32            | 74.33            | 0.021870            | 7.57              | 49.53             | 19.48            | 1.52         |
| monte treponti | 3000.9 VAR-109 | Q 50    | 260.00            | 68.50            | 70.96            | 74.76           | 3.80                | 73.50           | 2.54                | 71.39            | 72.80            | 0.016862            | 6.01              | 43.29             | 19.96            | 1.30         |
| monte treponti | 3000.9 VAR-109 | Q 200   | 320.00            | 68.50            | 71.24            | 74.76           | 3.52                | 73.50           | 2.26                | 71.79            | 73.41            | 0.017682            | 6.53              | 48.98             | 20.34            | 1.34         |
| monte treponti | 3000.9 VAR-109 | Q 500   | 375.00            | 68.50            | 71.52            | 74.76           | 3.24                | 73.50           | 1.98                | 72.13            | 73.91            | 0.017474            | 6.85              | 54.74             | 20.72            | 1.35         |
| monte treponti | 3000.4         | Q 50    | 260.00            | 67.20            | 69.06            | 74.76           | 5.70                | 73.50           | 4.44                | 70.10            | 72.61            | 0.044904            | 8.35              | 31.13             | 18.66            | 2.06         |
| monte treponti | 3000.4         | Q 200   | 320.00            | 67.20            | 69.35            | 74.76           | 5.41                | 73.50           | 4.15                | 70.51            | 73.23            | 0.041237            | 8.73              | 36.66             | 18.98            | 2.00         |
| monte treponti | 3000.4         | Q 500   | 375.00            | 67.20            | 69.62            | 74.76           | 5.14                | 73.50           | 3.88                | 70.85            | 73.73            | 0.038221            | 8.98              | 41.75             | 19.26            | 1.95         |
| monte treponti | 2970.4 VAR-108 | Q 50    | 260.00            | 66.50            | 68.80            | 74.70           | 5.90                | 71.50           | 2.70                | 69.57            | 71.30            | 0.026936            | 7.01              | 37.11             | 20.94            | 1.68         |
| monte treponti | 2970.4 VAR-108 | Q 200   | 320.00            | 66.50            | 69.04            | 74.70           | 5.66                | 71.50           | 2.46                | 69.94            | 71.97            | 0.027904            | 7.58              | 42.21             | 21.61            | 1.73         |
| monte treponti | 2970.4 VAR-108 | Q 500   | 375.00            | 66.50            | 69.24            | 74.70           | 5.46                | 71.50           | 2.26                | 70.24            | 72.52            | 0.028410            | 8.02              | 46.75             | 22.19            | 1.76         |
| monte treponti | 2944.4 VAR-107 | Q 50    | 260.00            | 65.90            | 68.12            | 75.28           | 7.16                | 71.15           | 3.03                | 68.88            | 70.58            | 0.027866            | 6.94              | 37.45             | 22.34            | 1.71         |
| monte treponti | 2944.4 VAR-107 | Q 200   | 320.00            | 65.90            | 68.36            | 75.28           | 6.92                | 71.15           | 2.79                | 69.25            | 71.21            | 0.028621            | 7.49              | 42.75             | 23.15            | 1.76         |

HEC-RAS Plan: 06\_Varenna River: Varenna Reach: monte treponti (Continued)

| Reach          | River Sta      | Profile | Q Total<br>(m3/s) | Min Ch El<br>(m) | W.S. Elev<br>(m) | LOB Elev<br>(m) | L. Freeboard<br>(m) | ROB Elev<br>(m) | R. Freeboard<br>(m) | Crit W.S.<br>(m) | E.G. Elev<br>(m) | E.G. Slope<br>(m/m) | Vel Chnl<br>(m/s) | Flow Area<br>(m2) | Top Width<br>(m) | Froude # Chl |
|----------------|----------------|---------|-------------------|------------------|------------------|-----------------|---------------------|-----------------|---------------------|------------------|------------------|---------------------|-------------------|-------------------|------------------|--------------|
| monte treponti | 2944.4 VAR-107 | Q 500   | 375.00            | 65.90            | 68.55            | 75.28           | 6.73                | 71.15           | 2.60                | 69.56            | 71.74            | 0.029115            | 7.92              | 47.38             | 23.83            | 1.79         |
| monte treponti | 2895.4 VAR-106 | Q 50    | 260.00            | 65.00            | 67.43            | 74.81           | 7.38                | 72.50           | 5.07                | 67.98            | 69.41            | 0.019876            | 6.24              | 41.68             | 22.05            | 1.45         |
| monte treponti | 2895.4 VAR-106 | Q 200   | 320.00            | 65.00            | 67.70            | 74.81           | 7.11                | 72.50           | 4.80                | 68.35            | 69.99            | 0.020062            | 6.70              | 47.77             | 22.70            | 1.47         |
| monte treponti | 2895.4 VAR-106 | Q 500   | 375.00            | 65.00            | 67.93            | 74.81           | 6.88                | 72.50           | 4.57                | 68.66            | 70.48            | 0.020242            | 7.07              | 53.02             | 23.25            | 1.50         |
| monte treponti | 2869.4 VAR-105 | Q 50    | 260.00            | 64.65            | 67.02            | 74.77           | 7.75                | 81.31           | 14.29               | 67.52            | 68.88            | 0.018501            | 6.04              | 43.03             | 22.53            | 1.40         |
| monte treponti | 2869.4 VAR-105 | Q 200   | 320.00            | 64.65            | 67.29            | 74.77           | 7.48                | 81.31           | 14.02               | 67.88            | 69.45            | 0.018741            | 6.51              | 49.14             | 23.04            | 1.42         |
| monte treponti | 2869.4 VAR-105 | Q 500   | 375.00            | 64.65            | 67.52            | 74.77           | 7.25                | 81.31           | 13.79               | 68.19            | 69.94            | 0.018904            | 6.89              | 54.45             | 23.46            | 1.44         |
| monte treponti | 2769.4 VAR-104 | Q 50    | 260.00            | 61.90            | 65.84            | 79.00           | 13.16               | 75.00           | 9.16                | 66.05            | 67.40            | 0.011829            | 5.54              | 46.95             | 18.83            | 1.12         |
| monte treponti | 2769.4 VAR-104 | Q 200   | 320.00            | 61.90            | 66.21            | 79.00           | 12.79               | 75.00           | 8.79                | 66.47            | 68.00            | 0.011934            | 5.92              | 54.04             | 19.50            | 1.14         |
| monte treponti | 2769.4 VAR-104 | Q 500   | 375.00            | 61.90            | 66.82            | 79.00           | 12.18               | 75.00           | 8.18                | 66.83            | 68.45            | 0.009129            | 5.65              | 66.33             | 20.61            | 1.01         |
| monte treponti | 2631.4         | Q 50    | 260.00            | 59.20            | 61.91            | 64.00           | 2.09                | 66.00           | 4.09                | 62.68            | 64.56            | 0.023344            | 7.21              | 36.09             | 16.82            | 1.57         |
| monte treponti | 2631.4         | Q 200   | 320.00            | 59.20            | 62.25            | 64.00           | 1.75                | 66.00           | 3.75                | 63.11            | 65.23            | 0.022810            | 7.64              | 41.87             | 17.25            | 1.57         |
| monte treponti | 2631.4         | Q 500   | 375.00            | 59.20            | 62.55            | 64.00           | 1.45                | 66.00           | 3.45                | 63.49            | 65.78            | 0.022147            | 7.96              | 47.09             | 17.55            | 1.55         |
| monte treponti | 2575.4         | Q 50    | 260.00            | 58.00            | 63.53            | 64.00           | 0.47                | 60.00           | -3.53               | 60.52            | 63.73            | 0.000653            | 2.04              | 131.67            | 28.55            | 0.29         |
| monte treponti | 2575.4         | Q 200   | 320.00            | 58.00            | 64.28            | 64.00           | -0.28               | 60.00           | -4.28               | 60.90            | 64.51            | 0.000627            | 2.16              | 153.58            | 30.50            | 0.29         |
| monte treponti | 2575.4         | Q 500   | 375.00            | 58.00            | 64.93            | 64.00           | -0.93               | 60.00           | -4.93               | 61.21            | 65.18            | 0.000594            | 2.26              | 172.76            | 33.19            | 0.29         |
| monte treponti | 2569.4 VAR-103 | Q 50    | 260.00            | 57.90            | 63.40            | 61.20           | -2.20               | 59.85           | -3.55               | 61.44            | 63.72            | 0.001113            | 2.70              | 111.09            | 26.81            | 0.39         |
| monte treponti | 2569.4 VAR-103 | Q 200   | 320.00            | 57.90            | 64.15            | 61.20           | -2.95               | 59.85           | -4.30               | 61.77            | 64.49            | 0.001019            | 2.84              | 131.15            | 26.99            | 0.38         |
| monte treponti | 2569.4 VAR-103 | Q 500   | 375.00            | 57.90            | 64.78            | 61.20           | -3.58               | 59.85           | -4.93               | 62.06            | 65.16            | 0.000962            | 2.97              | 148.34            | 27.00            | 0.38         |
| monte treponti | 2537.4 VAR-102 | Q 50    | 260.00            | 57.65            | 62.16            | 63.70           | 1.54                | 62.74           | 0.58                | 61.70            | 63.50            | 0.008213            | 5.13              | 50.69             | 13.18            | 0.83         |
| monte treponti | 2537.4 VAR-102 | Q 200   | 320.00            | 57.65            | 62.72            | 63.70           | 0.98                | 62.74           | 0.02                | 62.22            | 64.27            | 0.008487            | 5.50              | 58.13             | 13.29            | 0.84         |
| monte treponti | 2537.4 VAR-102 | Q 500   | 375.00            | 57.65            | 63.21            | 63.70           | 0.49                | 62.74           | -0.47               | 62.66            | 64.93            | 0.008489            | 5.81              | 64.61             | 13.66            | 0.84         |
| monte treponti | 2533.8         | Q 50    | 260.00            | 57.65            | 61.70            | 63.70           | 2.00                | 62.74           | 1.04                | 61.70            | 63.43            | 0.011746            | 5.82              | 44.67             | 13.09            | 1.01         |
| monte treponti | 2533.8         | Q 200   | 320.00            | 57.65            | 62.22            | 63.70           | 1.48                | 62.74           | 0.52                | 62.22            | 64.19            | 0.011943            | 6.22              | 51.43             | 13.19            | 1.01         |
| monte treponti | 2533.8         | Q 500   | 375.00            | 57.65            | 62.66            | 63.70           | 1.04                | 62.74           | 0.08                | 62.66            | 64.84            | 0.012135            | 6.55              | 57.29             | 13.27            | 1.01         |
| monte treponti | 2507.5 VAR-101 | Q 50    | 260.00            | 57.40            | 59.02            | 61.80           | 2.78                | 62.82           | 3.80                | 59.98            | 62.36            | 0.049098            | 8.10              | 32.10             | 22.32            | 2.16         |
| monte treponti | 2507.5 VAR-101 | Q 200   | 320.00            | 57.40            | 59.22            | 61.80           | 2.58                | 62.82           | 3.60                | 60.34            | 63.11            | 0.049132            | 8.75              | 36.59             | 22.35            | 2.18         |
| monte treponti | 2507.5 VAR-101 | Q 500   | 375.00            | 57.40            | 59.40            | 61.80           | 2.40                | 62.82           | 3.42                | 60.64            | 63.75            | 0.048732            | 9.24              | 40.58             | 22.39            | 2.19         |
| monte treponti | 2497.5         | Q 50    | 260.00            | 57.37            | 59.10            | 61.74           | 2.64                | 58.68           | -0.42               | 59.89            | 61.72            | 0.037199            | 7.44              | 37.12             | 23.91            | 1.84         |
| monte treponti | 2497.5         | Q 200   | 320.00            | 57.37            | 59.28            | 61.74           | 2.46                | 58.68           | -0.60               | 60.23            | 62.45            | 0.039923            | 8.20              | 41.44             | 24.07            | 1.92         |
| monte treponti | 2497.5         | Q 500   | 375.00            | 57.37            | 59.44            | 61.74           | 2.30                | 58.68           | -0.76               | 60.52            | 63.09            | 0.041552            | 8.80              | 45.28             | 24.22            | 1.98         |
| monte treponti | 2497.4 VAR-100 | Q 50    | 260.00            | 55.50            | 57.51            | 59.64           | 2.13                | 58.74           | 1.23                | 58.62            | 61.57            | 0.057709            | 8.97              | 29.61             | 20.56            | 2.27         |
| monte treponti | 2497.4 VAR-100 | Q 200   | 320.00            | 55.50            | 57.75            | 59.64           | 1.89                | 58.74           | 0.99                | 59.12            | 62.31            | 0.056066            | 9.55              | 34.45             | 20.86            | 2.26         |
| monte treponti | 2497.4 VAR-100 | Q 500   | 375.00            | 55.50            | 57.95            | 59.64           | 1.69                | 58.74           | 0.79                | 59.43            | 62.95            | 0.055032            | 10.01             | 38.66             | 21.12            | 2.25         |
| monte treponti | 2475.5 VAR-99  | Q 50    | 260.00            | 54.50            | 56.35            | 59.60           | 3.25                | 57.80           | 1.45                | 57.34            | 60.02            | 0.068863            | 8.49              | 30.64             | 26.64            | 2.53         |
| monte treponti | 2475.5 VAR-99  | Q 200   | 320.00            | 54.50            | 56.51            | 59.60           | 3.09                | 57.80           | 1.29                | 57.66            | 60.83            | 0.069616            | 9.21              | 34.74             | 26.64            | 2.57         |
| monte treponti | 2475.5 VAR-99  | Q 500   | 375.00            | 54.50            | 56.64            | 59.60           | 2.96                | 57.80           | 1.16                | 57.95            | 61.51            | 0.069597            | 9.77              | 38.36             | 26.64            | 2.60         |
| monte treponti | 2450.5 VAR-98  | Q 50    | 260.00            | 53.05            | 55.74            | 59.10           | 3.36                | 57.70           | 1.96                | 56.53            | 58.44            | 0.041810            | 7.27              | 35.75             | 26.37            | 1.99         |
| monte treponti | 2450.5 VAR-98  | Q 200   | 320.00            | 53.05            | 55.90            | 59.10           | 3.20                | 57.70           | 1.80                | 56.85            | 59.16            | 0.044242            | 8.00              | 39.99             | 26.39            | 2.07         |
| monte treponti | 2450.5 VAR-98  | Q 500   | 375.00            | 53.05            | 56.04            | 59.10           | 3.06                | 57.70           | 1.66                | 57.14            | 59.80            | 0.045930            | 8.59              | 43.66             | 26.40            | 2.13         |



HEC-RAS Plan: 06\_Varenna River: Varenna Reach: monte treponti (Continued)

| Reach          | River Sta     | Profile | Q Total<br>(m3/s) | Min Ch El<br>(m) | W.S. Elev<br>(m) | LOB Elev<br>(m) | L. Freeboard<br>(m) | ROB Elev<br>(m) | R. Freeboard<br>(m) | Crit W.S.<br>(m) | E.G. Elev<br>(m) | E.G. Slope<br>(m/m) | Vel Chnl<br>(m/s) | Flow Area<br>(m2) | Top Width<br>(m) | Froude # Chl |
|----------------|---------------|---------|-------------------|------------------|------------------|-----------------|---------------------|-----------------|---------------------|------------------|------------------|---------------------|-------------------|-------------------|------------------|--------------|
| monte treponti | 2425.5 VAR-97 | Q 50    | 260.00            | 52.10            | 57.08            | 59.00           | 1.92                | 56.28           | -0.80               | 55.38            | 57.53            | 0.002005            | 2.95              | 88.82             | 24.83            | 0.46         |
| monte treponti | 2425.5 VAR-97 | Q 200   | 320.00            | 52.10            | 57.88            | 59.00           | 1.12                | 56.28           | -1.60               | 55.76            | 58.33            | 0.001719            | 3.01              | 109.76            | 27.66            | 0.43         |
| monte treponti | 2425.5 VAR-97 | Q 500   | 375.00            | 52.10            | 58.59            | 59.00           | 0.41                | 56.28           | -2.31               | 56.08            | 59.05            | 0.001496            | 3.03              | 129.74            | 28.14            | 0.41         |
| monte treponti | 2418.5 VAR-96 | Q 50    | 260.00            | 52.00            | 56.24            | 59.00           | 2.77                | 57.70           | 1.46                | 55.62            | 57.43            | 0.007094            | 4.84              | 53.74             | 13.88            | 0.78         |
| monte treponti | 2418.5 VAR-96 | Q 200   | 320.00            | 52.00            | 56.99            | 59.00           | 2.01                | 57.70           | 0.71                | 56.14            | 58.23            | 0.006846            | 4.94              | 64.75             | 15.73            | 0.78         |
| monte treponti | 2418.5 VAR-96 | Q 500   | 375.00            | 52.00            | 57.81            | 59.00           | 1.19                | 57.70           | -0.11               | 56.62            | 58.96            | 0.005791            | 4.75              | 79.81             | 22.59            | 0.73         |
| monte treponti | 2416.2        | Bridge  |                   |                  |                  |                 |                     |                 |                     |                  |                  |                     |                   |                   |                  |              |
| monte treponti | 2413.5 VAR-95 | Q 50    | 260.00            | 51.90            | 55.52            | 59.00           | 3.48                | 57.70           | 2.18                | 55.52            | 57.20            | 0.011476            | 5.74              | 45.29             | 13.49            | 1.00         |
| monte treponti | 2413.5 VAR-95 | Q 200   | 320.00            | 51.90            | 56.04            | 59.00           | 2.96                | 57.70           | 1.66                | 56.04            | 57.95            | 0.011578            | 6.12              | 52.32             | 13.77            | 1.00         |
| monte treponti | 2413.5 VAR-95 | Q 500   | 375.00            | 51.90            | 56.50            | 59.00           | 2.50                | 57.70           | 1.20                | 56.50            | 58.58            | 0.011622            | 6.39              | 58.68             | 14.15            | 1.00         |
| monte treponti | 2388.5 VAR-94 | Q 50    | 260.00            | 51.20            | 53.65            | 58.30           | 4.65                | 56.96           | 3.31                | 54.56            | 56.56            | 0.028629            | 7.56              | 34.40             | 16.95            | 1.69         |
| monte treponti | 2388.5 VAR-94 | Q 200   | 320.00            | 51.20            | 53.95            | 58.30           | 4.35                | 56.96           | 3.01                | 54.98            | 57.28            | 0.029254            | 8.09              | 39.55             | 17.74            | 1.73         |
| monte treponti | 2388.5 VAR-94 | Q 500   | 375.00            | 51.20            | 54.20            | 58.30           | 4.10                | 56.96           | 2.76                | 55.32            | 57.89            | 0.029728            | 8.52              | 44.03             | 18.41            | 1.76         |
| monte treponti | 2363.5 VAR-93 | Q 50    | 260.00            | 49.94            | 51.50            | 68.60           | 17.10               | 60.00           | 8.50                | 52.59            | 55.28            | 0.081012            | 8.61              | 30.19             | 21.46            | 2.32         |
| monte treponti | 2363.5 VAR-93 | Q 200   | 320.00            | 49.94            | 51.72            | 68.60           | 16.88               | 60.00           | 8.28                | 52.95            | 56.00            | 0.078681            | 9.17              | 34.90             | 21.96            | 2.32         |
| monte treponti | 2363.5 VAR-93 | Q 500   | 375.00            | 49.94            | 51.91            | 68.60           | 16.69               | 60.00           | 8.09                | 53.26            | 56.61            | 0.077017            | 9.61              | 39.01             | 22.38            | 2.32         |
| monte treponti | 2283.5 VAR-92 | Q 50    | 260.00            | 45.90            | 47.59            | 65.00           | 17.41               | 60.00           | 12.41               | 48.46            | 50.44            | 0.056302            | 7.48              | 34.75             | 23.45            | 1.96         |
| monte treponti | 2283.5 VAR-92 | Q 200   | 320.00            | 45.90            | 47.80            | 65.00           | 17.20               | 60.00           | 12.20               | 48.80            | 51.08            | 0.055994            | 8.02              | 39.89             | 24.04            | 1.99         |
| monte treponti | 2283.5 VAR-92 | Q 500   | 375.00            | 45.90            | 47.98            | 65.00           | 17.02               | 60.00           | 12.02               | 49.10            | 51.64            | 0.056000            | 8.47              | 44.29             | 24.53            | 2.01         |
| monte treponti | 2223.5 VAR-91 | Q 50    | 260.00            | 42.88            | 45.99            | 55.00           | 9.01                | 62.00           | 16.01               | 46.61            | 48.20            | 0.031378            | 6.58              | 39.50             | 20.09            | 1.50         |
| monte treponti | 2223.5 VAR-91 | Q 200   | 320.00            | 42.88            | 46.31            | 55.00           | 8.69                | 62.00           | 15.69               | 47.00            | 48.77            | 0.029830            | 6.95              | 46.05             | 20.44            | 1.48         |
| monte treponti | 2223.5 VAR-91 | Q 500   | 375.00            | 42.88            | 46.59            | 55.00           | 8.41                | 62.00           | 15.41               | 47.33            | 49.27            | 0.028876            | 7.25              | 51.72             | 20.75            | 1.47         |
| monte treponti | 2208.5 VAR-90 | Q 50    | 260.00            | 42.34            | 46.44            | 55.00           | 8.56                | 62.00           | 15.56               | 46.44            | 47.74            | 0.013543            | 5.05              | 51.51             | 20.17            | 1.01         |
| monte treponti | 2208.5 VAR-90 | Q 200   | 320.00            | 42.34            | 46.85            | 55.00           | 8.15                | 62.00           | 15.15               | 46.85            | 48.31            | 0.013309            | 5.36              | 59.73             | 20.77            | 1.01         |
| monte treponti | 2208.5 VAR-90 | Q 500   | 375.00            | 42.34            | 47.19            | 55.00           | 7.81                | 62.00           | 14.81               | 47.19            | 48.79            | 0.013071            | 5.59              | 67.05             | 21.29            | 1.01         |
| monte treponti | 2186.5 VAR-89 | Q 50    | 260.00            | 41.23            | 43.94            | 50.00           | 6.06                | 50.00           | 6.06                | 44.88            | 46.98            | 0.051949            | 7.73              | 33.63             | 20.14            | 1.91         |
| monte treponti | 2186.5 VAR-89 | Q 200   | 320.00            | 41.23            | 44.22            | 50.00           | 5.78                | 50.00           | 5.78                | 45.22            | 47.55            | 0.052229            | 8.08              | 39.60             | 22.30            | 1.94         |
| monte treponti | 2186.5 VAR-89 | Q 500   | 375.00            | 41.23            | 44.44            | 50.00           | 5.56                | 50.00           | 5.56                | 45.52            | 48.02            | 0.052108            | 8.38              | 44.73             | 23.77            | 1.95         |
| monte treponti | 2171.5 VAR-88 | Q 50    | 270.00            | 40.77            | 43.84            | 50.00           | 6.16                | 50.81           | 6.97                | 44.56            | 46.15            | 0.033081            | 6.73              | 40.09             | 21.14            | 1.56         |
| monte treponti | 2171.5 VAR-88 | Q 200   | 332.00            | 40.77            | 44.15            | 50.00           | 5.85                | 50.81           | 6.66                | 44.95            | 46.71            | 0.032588            | 7.09              | 46.85             | 22.59            | 1.57         |
| monte treponti | 2171.5 VAR-88 | Q 500   | 388.00            | 40.77            | 44.40            | 50.00           | 5.60                | 50.81           | 6.41                | 45.38            | 47.18            | 0.032563            | 7.39              | 52.52             | 23.73            | 1.59         |
| monte treponti | 2143.5 VAR-87 | Q 50    | 270.00            | 39.04            | 42.44            | 46.68           | 4.24                | 50.70           | 8.26                | 43.32            | 45.13            | 0.038270            | 7.27              | 37.14             | 18.99            | 1.66         |
| monte treponti | 2143.5 VAR-87 | Q 200   | 332.00            | 39.04            | 42.77            | 46.68           | 3.91                | 50.70           | 7.93                | 43.70            | 45.70            | 0.038160            | 7.59              | 43.75             | 20.93            | 1.68         |
| monte treponti | 2143.5 VAR-87 | Q 500   | 388.00            | 39.04            | 43.02            | 46.68           | 3.66                | 50.70           | 7.68                | 44.00            | 46.18            | 0.038324            | 7.87              | 49.32             | 22.43            | 1.69         |
| monte treponti | 2131.5 VAR-86 | Q 50    | 270.00            | 38.69            | 43.62            | 50.77           | 7.15                | 50.68           | 7.06                | 43.14            | 44.57            | 0.008635            | 4.32              | 62.51             | 20.23            | 0.78         |
| monte treponti | 2131.5 VAR-86 | Q 200   | 332.00            | 38.69            | 44.07            | 50.77           | 6.70                | 50.68           | 6.61                | 43.54            | 45.17            | 0.008742            | 4.64              | 71.60             | 20.59            | 0.79         |
| monte treponti | 2131.5 VAR-86 | Q 500   | 388.00            | 38.69            | 44.45            | 50.77           | 6.32                | 50.68           | 6.23                | 43.88            | 45.66            | 0.008808            | 4.88              | 79.45             | 20.91            | 0.80         |
| monte treponti | 2128.0 VAR-86 | Bridge  |                   |                  |                  |                 |                     |                 |                     |                  |                  |                     |                   |                   |                  |              |
| monte treponti | 2124.5 VAR-86 | Q 50    | 270.00            | 38.69            | 43.13            | 50.77           | 7.64                | 50.68           | 7.55                | 43.13            | 44.47            | 0.014443            | 5.13              | 52.62             | 19.82            | 1.01         |
| monte treponti | 2124.5 VAR-86 | Q 200   | 332.00            | 38.69            | 43.54            | 50.77           | 7.23                | 50.68           | 7.14                | 43.54            | 45.06            | 0.014214            | 5.47              | 60.75             | 20.15            | 1.00         |

HEC-RAS Plan: 06\_Varenna River: Varenna Reach: monte treponti (Continued)

| Reach          | River Sta     | Profile | Q Total<br>(m3/s) | Min Ch El<br>(m) | W.S. Elev<br>(m) | LOB Elev<br>(m) | L. Freeboard<br>(m) | ROB Elev<br>(m) | R. Freeboard<br>(m) | Crit W.S.<br>(m) | E.G. Elev<br>(m) | E.G. Slope<br>(m/m) | Vel Chnl<br>(m/s) | Flow Area<br>(m2) | Top Width<br>(m) | Froude # Chl |
|----------------|---------------|---------|-------------------|------------------|------------------|-----------------|---------------------|-----------------|---------------------|------------------|------------------|---------------------|-------------------|-------------------|------------------|--------------|
| monte treponti | 2124.5 VAR-86 | Q 500   | 388.00            | 38.69            | 43.88            | 50.77           | 6.89                | 50.68           | 6.80                | 43.88            | 45.55            | 0.014139            | 5.74              | 67.61             | 20.43            | 1.01         |
| monte treponti | 2110.5 VAR-85 | Q 50    | 270.00            | 38.21            | 41.21            | 39.90           | -1.31               | 50.75           | 9.54                | 42.01            | 44.02            | 0.036199            | 7.43              | 36.35             | 15.38            | 1.54         |
| monte treponti | 2110.5 VAR-85 | Q 200   | 332.00            | 38.21            | 41.69            | 39.90           | -1.79               | 50.75           | 9.06                | 42.47            | 44.63            | 0.031765            | 7.60              | 43.67             | 15.50            | 1.45         |
| monte treponti | 2110.5 VAR-85 | Q 500   | 388.00            | 38.21            | 42.11            | 39.90           | -2.21               | 50.75           | 8.64                | 42.87            | 45.15            | 0.028745            | 7.72              | 50.27             | 15.61            | 1.37         |
| monte treponti | 2049.5 VAR-84 | Q 50    | 270.00            | 37.76            | 40.39            | 40.44           | 0.05                | 43.20           | 2.81                | 40.90            | 42.27            | 0.019084            | 6.08              | 44.39             | 23.71            | 1.42         |
| monte treponti | 2049.5 VAR-84 | Q 200   | 332.00            | 37.76            | 40.58            | 40.44           | -0.14               | 43.20           | 2.62                | 41.23            | 42.91            | 0.021506            | 6.76              | 49.10             | 24.34            | 1.52         |
| monte treponti | 2049.5 VAR-84 | Q 500   | 388.00            | 37.76            | 40.74            | 40.44           | -0.30               | 43.20           | 2.46                | 41.52            | 43.47            | 0.023494            | 7.33              | 52.96             | 24.73            | 1.60         |
| monte treponti | 2000.5 VAR-83 | Q 50    | 270.00            | 35.50            | 38.16            | 39.54           | 1.38                | 45.00           | 6.84                | 39.07            | 41.01            | 0.028442            | 7.47              | 36.15             | 19.28            | 1.74         |
| monte treponti | 2000.5 VAR-83 | Q 200   | 332.00            | 35.50            | 38.47            | 39.54           | 1.07                | 45.00           | 6.53                | 39.47            | 41.63            | 0.027981            | 7.88              | 42.15             | 20.43            | 1.75         |
| monte treponti | 2000.5 VAR-83 | Q 500   | 388.00            | 35.50            | 38.70            | 39.54           | 0.84                | 45.00           | 6.30                | 39.79            | 42.16            | 0.028050            | 8.24              | 47.11             | 21.33            | 1.77         |
| monte treponti | 1951.5 VAR-82 | Q 50    | 270.00            | 33.48            | 35.48            | 38.45           | 2.97                | 38.13           | 2.65                | 36.58            | 39.26            | 0.047075            | 8.61              | 31.36             | 19.74            | 2.18         |
| monte treponti | 1951.5 VAR-82 | Q 200   | 332.00            | 33.48            | 35.75            | 38.45           | 2.70                | 38.13           | 2.38                | 36.97            | 39.92            | 0.043966            | 9.05              | 36.70             | 20.05            | 2.13         |
| monte treponti | 1951.5 VAR-82 | Q 500   | 388.00            | 33.48            | 35.98            | 38.45           | 2.47                | 38.13           | 2.15                | 37.31            | 40.47            | 0.041926            | 9.39              | 41.31             | 20.31            | 2.10         |
| monte treponti | 1929.6 VAR-81 | Q 50    | 270.00            | 33.00            | 35.65            | 38.45           | 2.80                | 38.16           | 2.51                | 36.27            | 37.94            | 0.021151            | 6.70              | 40.30             | 17.99            | 1.43         |
| monte treponti | 1929.6 VAR-81 | Q 200   | 332.00            | 33.00            | 35.97            | 38.45           | 2.48                | 38.16           | 2.19                | 36.70            | 38.62            | 0.021442            | 7.20              | 46.08             | 18.31            | 1.45         |
| monte treponti | 1929.6 VAR-81 | Q 500   | 388.00            | 33.00            | 36.24            | 38.45           | 2.21                | 38.16           | 1.92                | 37.06            | 39.18            | 0.021543            | 7.59              | 51.12             | 18.58            | 1.46         |
| monte treponti | 1929.1 VAR-81 | Q 50    | 270.00            | 31.94            | 34.79            | 38.62           | 3.83                | 37.35           | 2.56                | 35.70            | 37.85            | 0.034839            | 7.75              | 34.86             | 21.73            | 1.95         |
| monte treponti | 1929.1 VAR-81 | Q 200   | 332.00            | 31.94            | 35.04            | 38.62           | 3.58                | 37.35           | 2.31                | 36.07            | 38.52            | 0.033681            | 8.26              | 40.17             | 21.74            | 1.94         |
| monte treponti | 1929.1 VAR-81 | Q 500   | 388.00            | 31.94            | 35.25            | 38.62           | 3.37                | 37.35           | 2.10                | 36.38            | 39.07            | 0.033512            | 8.67              | 44.76             | 22.22            | 1.95         |
| monte treponti | 1911.3 VAR-80 | Q 50    | 270.00            | 31.84            | 35.00            | 35.14           | 0.14                | 34.35           | -0.65               | 35.61            | 37.20            | 0.015677            | 6.65              | 42.09             | 21.21            | 1.41         |
| monte treponti | 1911.3 VAR-80 | Q 200   | 332.00            | 31.84            | 35.26            | 35.14           | -0.12               | 34.35           | -0.91               | 35.99            | 37.85            | 0.016844            | 7.24              | 47.67             | 21.69            | 1.47         |
| monte treponti | 1911.3 VAR-80 | Q 500   | 388.00            | 31.84            | 35.48            | 35.14           | -0.34               | 34.35           | -1.13               | 36.31            | 38.41            | 0.017303            | 7.71              | 52.42             | 21.69            | 1.50         |
| monte treponti | 1886.2 VAR-79 | Q 50    | 270.00            | 31.12            | 34.49            | 40.13           | 5.64                | 36.53           | 2.04                | 35.14            | 36.71            | 0.022075            | 6.60              | 40.88             | 24.84            | 1.64         |
| monte treponti | 1886.2 VAR-79 | Q 200   | 332.00            | 31.12            | 34.69            | 40.13           | 5.44                | 36.53           | 1.84                | 35.48            | 37.35            | 0.023332            | 7.23              | 45.94             | 25.23            | 1.71         |
| monte treponti | 1886.2 VAR-79 | Q 500   | 388.00            | 31.12            | 34.86            | 40.13           | 5.27                | 36.53           | 1.67                | 35.77            | 37.89            | 0.023988            | 7.71              | 50.33             | 25.40            | 1.75         |
| monte treponti | 1859.8 VAR-78 | Q 50    | 270.00            | 30.99            | 33.53            | 39.67           | 6.14                | 36.10           | 2.57                | 34.31            | 36.05            | 0.025894            | 7.04              | 38.34             | 24.46            | 1.80         |
| monte treponti | 1859.8 VAR-78 | Q 200   | 332.00            | 30.99            | 33.75            | 39.67           | 5.92                | 36.10           | 2.35                | 34.76            | 36.68            | 0.026120            | 7.58              | 43.78             | 25.05            | 1.83         |
| monte treponti | 1859.8 VAR-78 | Q 500   | 388.00            | 30.99            | 33.93            | 39.67           | 5.74                | 36.10           | 2.17                | 35.01            | 37.20            | 0.026352            | 8.02              | 48.39             | 25.54            | 1.86         |
| monte treponti | 1839.0 VAR-77 | Q 50    | 270.00            | 30.66            | 32.78            | 38.53           | 5.75                | 36.86           | 4.08                | 33.59            | 35.43            | 0.035945            | 7.20              | 37.49             | 30.48            | 2.07         |
| monte treponti | 1839.0 VAR-77 | Q 200   | 332.00            | 30.66            | 32.95            | 38.53           | 5.58                | 36.86           | 3.91                | 33.85            | 36.02            | 0.037682            | 7.77              | 42.75             | 32.14            | 2.15         |
| monte treponti | 1839.0 VAR-77 | Q 500   | 388.00            | 30.66            | 33.09            | 38.53           | 5.44                | 36.86           | 3.77                | 34.08            | 36.53            | 0.038562            | 8.22              | 47.22             | 33.08            | 2.20         |
| monte treponti | 1825.1 VAR-76 | Q 50    | 270.00            | 30.90            | 32.69            | 37.89           | 5.20                | 36.59           | 3.90                | 33.38            | 34.82            | 0.028051            | 6.47              | 41.75             | 33.04            | 1.84         |
| monte treponti | 1825.1 VAR-76 | Q 200   | 332.00            | 30.90            | 34.64            | 37.89           | 3.25                | 36.59           | 1.95                | 33.63            | 35.04            | 0.002101            | 2.83              | 117.39            | 43.47            | 0.55         |
| monte treponti | 1825.1 VAR-76 | Q 500   | 388.00            | 30.90            | 35.38            | 37.89           | 2.51                | 36.59           | 1.21                | 33.84            | 35.73            | 0.001324            | 2.59              | 149.93            | 43.56            | 0.45         |
| monte treponti | 1802.9 VAR-75 | Q 50    | 270.00            | 30.25            | 33.87            | 36.95           | 3.08                | 36.15           | 2.28                | 32.84            | 34.23            | 0.001825            | 2.67              | 101.28            | 37.42            | 0.52         |
| monte treponti | 1802.9 VAR-75 | Q 200   | 332.00            | 30.25            | 34.66            | 36.95           | 2.29                | 36.15           | 1.49                | 33.13            | 34.98            | 0.001248            | 2.53              | 131.32            | 38.57            | 0.44         |
| monte treponti | 1802.9 VAR-75 | Q 500   | 388.00            | 30.25            | 35.39            | 36.95           | 1.56                | 36.15           | 0.76                | 33.36            | 35.69            | 0.000934            | 2.43              | 159.47            | 38.60            | 0.38         |
| monte treponti | 1780.8 VAR-74 | Q 50    | 270.00            | 29.58            | 33.74            | 37.05           | 3.31                | 36.30           | 2.56                | 32.65            | 34.18            | 0.002057            | 2.95              | 91.51             | 29.96            | 0.54         |
| monte treponti | 1780.8 VAR-74 | Q 200   | 332.00            | 29.58            | 34.52            | 37.05           | 2.53                | 36.30           | 1.78                | 32.99            | 34.94            | 0.001543            | 2.89              | 115.01            | 30.06            | 0.47         |
| monte treponti | 1780.8 VAR-74 | Q 500   | 388.00            | 29.58            | 35.25            | 37.05           | 1.80                | 36.30           | 1.05                | 33.26            | 35.66            | 0.001245            | 2.83              | 136.88            | 30.15            | 0.42         |

HEC-RAS Plan: 06\_Varenna River: Varenna Reach: monte treponti (Continued)

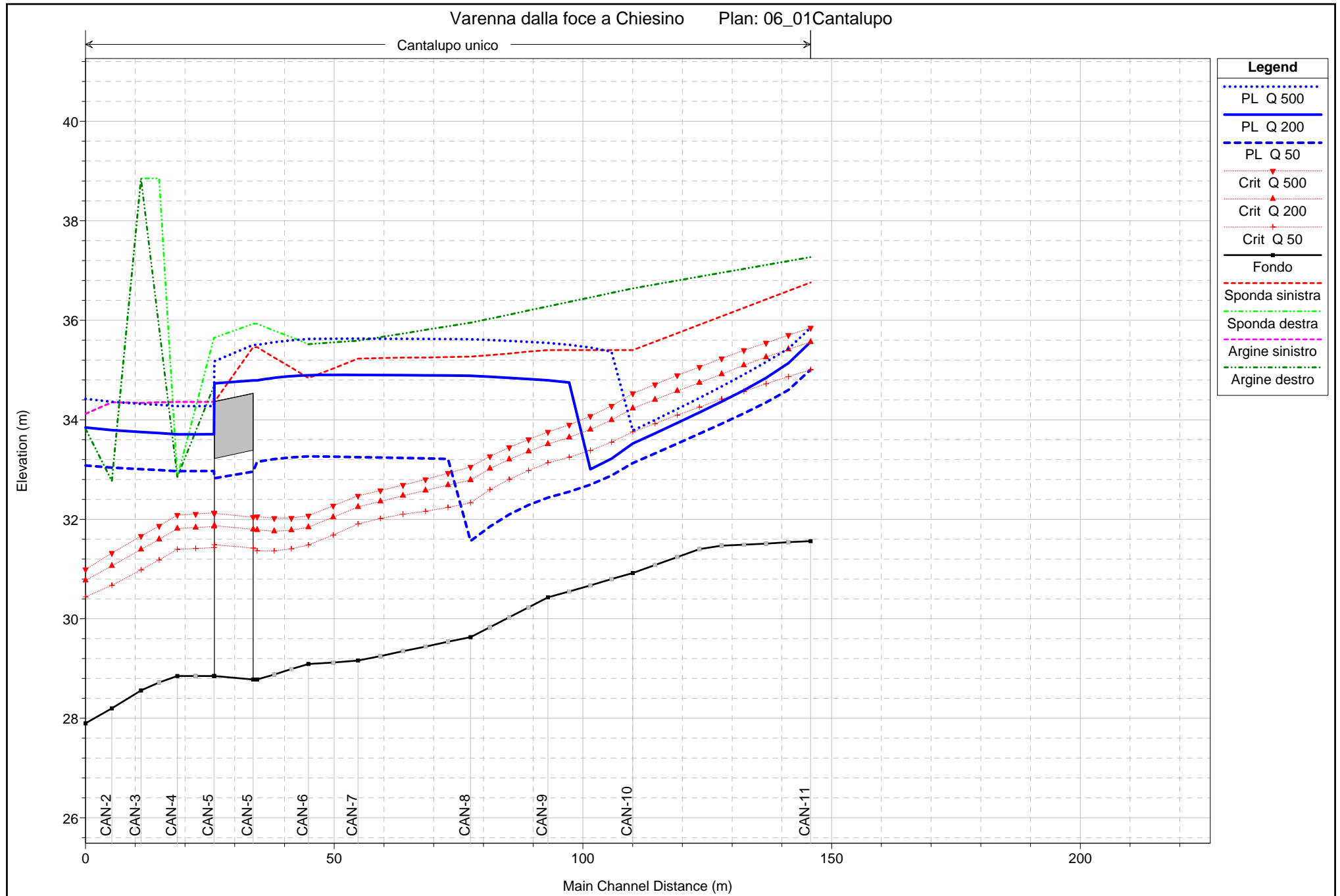
| Reach          | River Sta     | Profile | Q Total<br>(m3/s) | Min Ch El<br>(m) | W.S. Elev<br>(m) | LOB Elev<br>(m) | L. Freeboard<br>(m) | ROB Elev<br>(m) | R. Freeboard<br>(m) | Crit W.S.<br>(m) | E.G. Elev<br>(m) | E.G. Slope<br>(m/m) | Vel Chnl<br>(m/s) | Flow Area<br>(m2) | Top Width<br>(m) | Froude # Chl |
|----------------|---------------|---------|-------------------|------------------|------------------|-----------------|---------------------|-----------------|---------------------|------------------|------------------|---------------------|-------------------|-------------------|------------------|--------------|
| monte treponti | 1771.7 VAR-73 | Q 50    | 270.00            | 29.48            | 33.35            | 37.42           | 4.07                | 37.38           | 4.03                | 32.55            | 34.12            | 0.003596            | 3.90              | 69.21             | 20.20            | 0.67         |
| monte treponti | 1771.7 VAR-73 | Q 200   | 332.00            | 29.48            | 34.10            | 37.42           | 3.32                | 37.38           | 3.28                | 32.93            | 34.89            | 0.003022            | 3.93              | 84.48             | 20.27            | 0.61         |
| monte treponti | 1771.7 VAR-73 | Q 500   | 388.00            | 29.48            | 34.82            | 37.42           | 2.60                | 37.38           | 2.56                | 33.27            | 35.60            | 0.002600            | 3.92              | 99.09             | 20.34            | 0.57         |
| monte treponti | 1767.9 VAR-73 | Bridge  |                   |                  |                  |                 |                     |                 |                     |                  |                  |                     |                   |                   |                  |              |
| monte treponti | 1763.0 VAR-73 | Q 50    | 270.00            | 29.39            | 32.94            | 36.55           | 3.61                | 36.79           | 3.85                | 32.54            | 33.93            | 0.005082            | 4.41              | 61.24             | 20.24            | 0.81         |
| monte treponti | 1763.0 VAR-73 | Q 200   | 332.00            | 29.39            | 33.67            | 36.55           | 2.88                | 36.79           | 3.12                | 32.93            | 34.64            | 0.004017            | 4.36              | 76.18             | 20.39            | 0.72         |
| monte treponti | 1763.0 VAR-73 | Q 500   | 388.00            | 29.39            | 34.30            | 36.55           | 2.25                | 36.79           | 2.48                | 33.26            | 35.27            | 0.003473            | 4.36              | 89.08             | 20.52            | 0.67         |
| monte treponti | 1755.4 VAR-72 | Q 50    | 270.00            | 28.95            | 33.17            | 35.55           | 2.38                | 36.52           | 3.35                | 32.18            | 33.79            | 0.002757            | 3.50              | 77.21             | 22.62            | 0.60         |
| monte treponti | 1755.4 VAR-72 | Q 200   | 332.00            | 28.95            | 33.88            | 35.55           | 1.67                | 36.52           | 2.64                | 32.55            | 34.52            | 0.002374            | 3.56              | 93.30             | 22.73            | 0.56         |
| monte treponti | 1755.4 VAR-72 | Q 500   | 388.00            | 28.95            | 34.50            | 35.55           | 1.05                | 36.52           | 2.02                | 32.86            | 35.16            | 0.002146            | 3.61              | 107.40            | 22.83            | 0.53         |
| monte treponti | 1747.9 VAR-71 | Q 50    | 270.00            | 28.78            | 33.19            | 38.85           | 5.66                | 36.16           | 2.97                | 31.91            | 33.75            | 0.002270            | 3.30              | 81.72             | 21.58            | 0.54         |
| monte treponti | 1747.9 VAR-71 | Q 200   | 332.00            | 28.78            | 33.89            | 38.85           | 4.96                | 36.16           | 2.27                | 32.29            | 34.49            | 0.002086            | 3.43              | 96.82             | 21.70            | 0.52         |
| monte treponti | 1747.9 VAR-71 | Q 500   | 388.00            | 28.78            | 34.50            | 38.85           | 4.35                | 36.16           | 1.66                | 32.61            | 35.14            | 0.001963            | 3.52              | 110.09            | 21.81            | 0.50         |
| monte treponti | 1739.0 VAR-70 | Q 50    | 270.00            | 28.60            | 32.95            | 31.14           | -1.81               | 35.74           | 2.79                | 31.99            | 33.71            | 0.003341            | 3.85              | 70.21             | 19.06            | 0.64         |
| monte treponti | 1739.0 VAR-70 | Q 200   | 332.00            | 28.60            | 33.64            | 31.14           | -2.50               | 35.74           | 2.10                | 32.40            | 34.45            | 0.003068            | 3.98              | 83.32             | 19.15            | 0.61         |
| monte treponti | 1739.0 VAR-70 | Q 500   | 388.00            | 28.60            | 34.24            | 31.14           | -3.10               | 35.74           | 1.50                | 32.75            | 35.09            | 0.002889            | 4.09              | 94.84             | 19.24            | 0.59         |
| monte treponti | 1730.1 VAR-69 | Q 50    | 270.00            | 28.30            | 32.72            | 31.00           | -1.72               | 35.42           | 2.70                | 31.88            | 33.65            | 0.004263            | 4.29              | 62.96             | 16.26            | 0.70         |
| monte treponti | 1730.1 VAR-69 | Q 200   | 332.00            | 28.30            | 33.34            | 31.00           | -2.34               | 35.42           | 2.08                | 32.33            | 34.39            | 0.004205            | 4.54              | 73.12             | 16.33            | 0.69         |
| monte treponti | 1730.1 VAR-69 | Q 500   | 388.00            | 28.30            | 33.90            | 31.00           | -2.90               | 35.42           | 1.52                | 32.72            | 35.03            | 0.004118            | 4.72              | 82.28             | 16.40            | 0.67         |
| monte treponti | 1720.2 VAR-68 | Q 50    | 270.00            | 28.18            | 31.87            | 38.85           | 6.98                | 34.11           | 2.24                | 31.87            | 33.52            | 0.009475            | 5.69              | 47.43             | 14.38            | 1.00         |
| monte treponti | 1720.2 VAR-68 | Q 200   | 332.00            | 28.18            | 32.62            | 38.85           | 6.23                | 34.11           | 1.49                | 32.36            | 34.28            | 0.007937            | 5.70              | 58.26             | 14.46            | 0.91         |
| monte treponti | 1720.2 VAR-68 | Q 500   | 388.00            | 28.18            | 33.16            | 38.85           | 5.69                | 34.11           | 0.95                | 32.78            | 34.92            | 0.007603            | 5.87              | 66.06             | 14.51            | 0.88         |
| monte treponti | 1708.8 VAR-67 | Q 50    | 270.00            | 27.83            | 30.71            | 38.85           | 8.14                | 34.08           | 3.37                | 31.41            | 33.28            | 0.018972            | 7.10              | 38.03             | 15.90            | 1.47         |
| monte treponti | 1708.8 VAR-67 | Q 200   | 332.00            | 27.83            | 33.01            | 38.85           | 5.84                | 34.08           | 1.07                | 31.86            | 34.02            | 0.004022            | 4.45              | 74.53             | 15.90            | 0.66         |
| monte treponti | 1708.8 VAR-67 | Q 500   | 388.00            | 27.83            | 33.55            | 38.85           | 5.30                | 34.08           | 0.53                | 32.25            | 34.66            | 0.004040            | 4.67              | 83.16             | 15.90            | 0.65         |
| monte treponti | 1702.0 VAR-66 | Q 50    | 270.00            | 27.78            | 32.13            | 33.38           | 1.25                | 33.39           | 1.26                | 31.33            | 33.12            | 0.004641            | 4.40              | 61.40             | 15.69            | 0.71         |
| monte treponti | 1702.0 VAR-66 | Q 200   | 332.00            | 27.78            | 32.99            | 33.38           | 0.39                | 33.39           | 0.40                | 31.79            | 33.99            | 0.003993            | 4.44              | 74.85             | 15.69            | 0.65         |
| monte treponti | 1702.0 VAR-66 | Q 500   | 388.00            | 27.78            | 33.53            | 33.38           | -0.15               | 33.39           | -0.14               | 32.18            | 34.63            | 0.004006            | 4.65              | 83.60             | 17.59            | 0.64         |

*Piano di Bacino Stralcio del torrente Varenna*  
Verifiche idrauliche

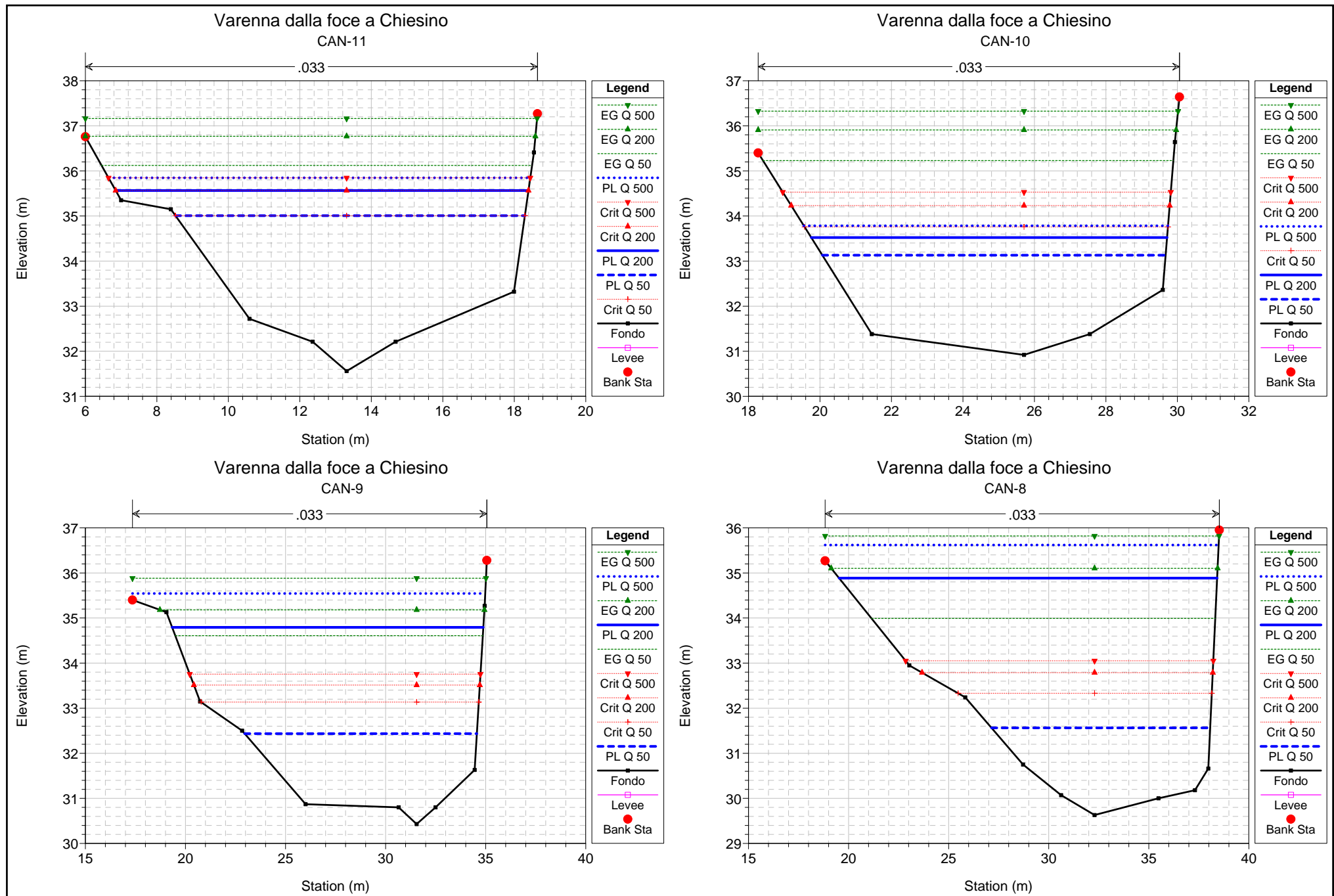
## **Rio Cantalupo**

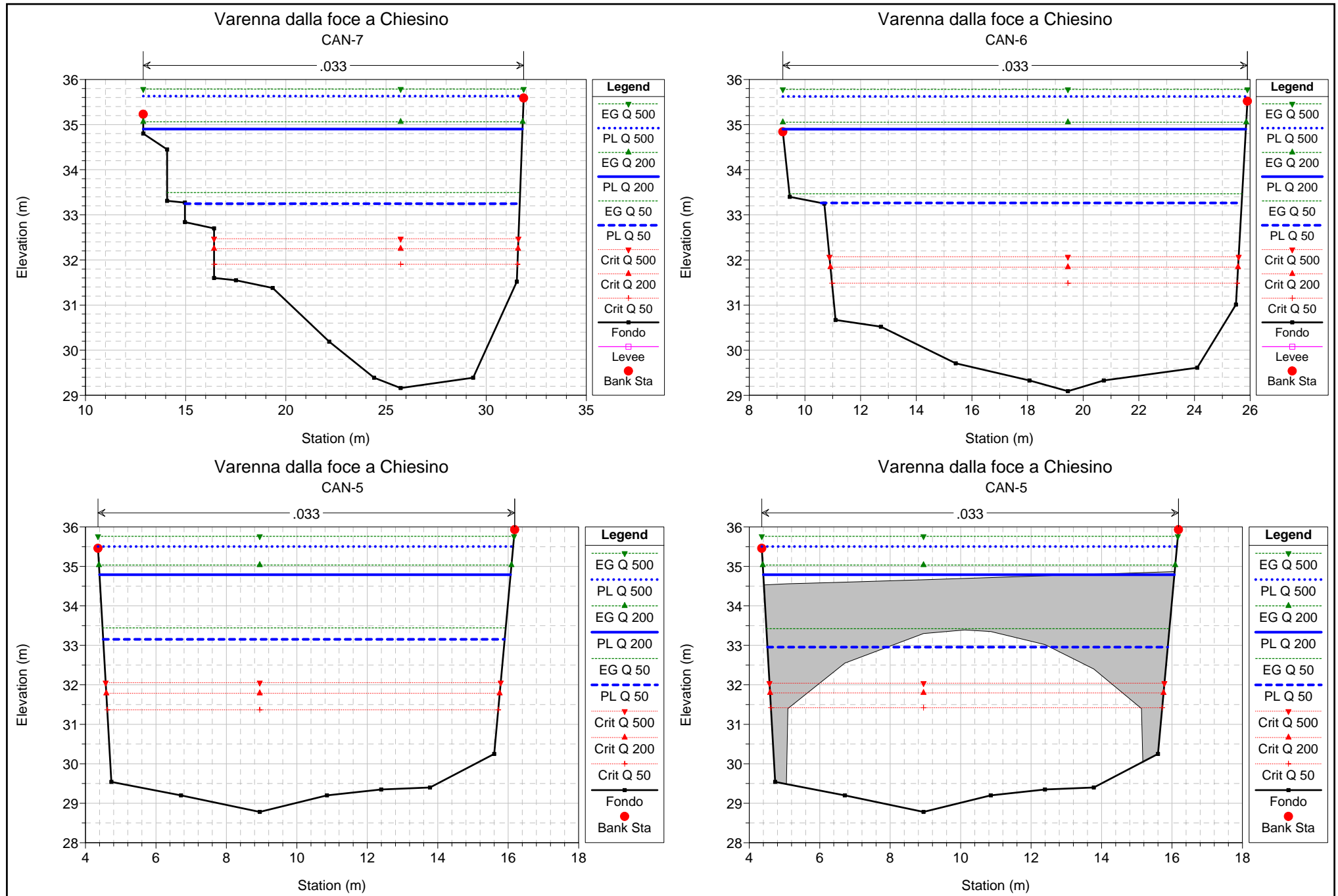
Tratto confluenza - dalla sezione CAN11 alla CAN1  
alla confluenza con il Varenna

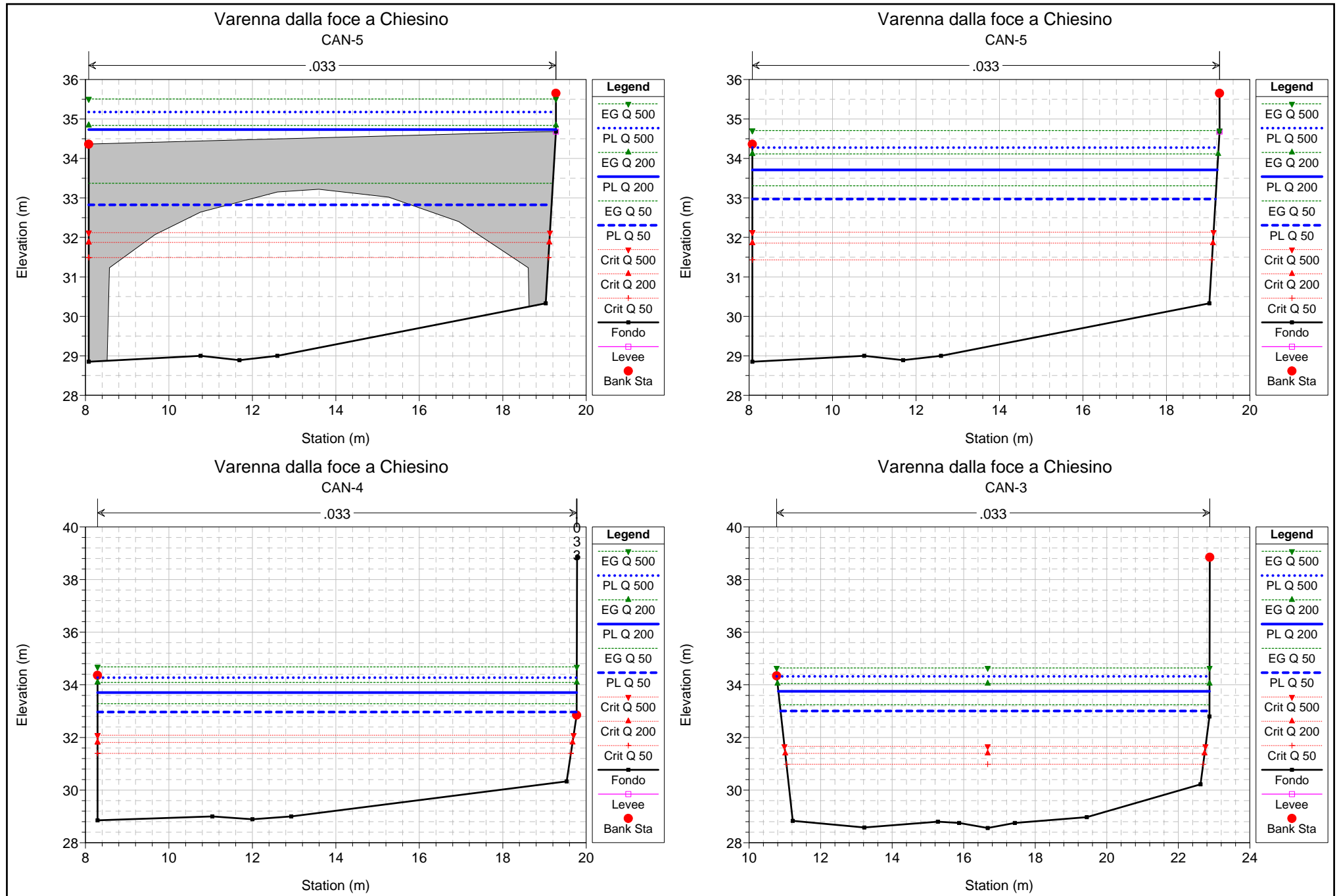
- Profili di corrente
- Sezioni idrauliche
- Tabelle dei risultati



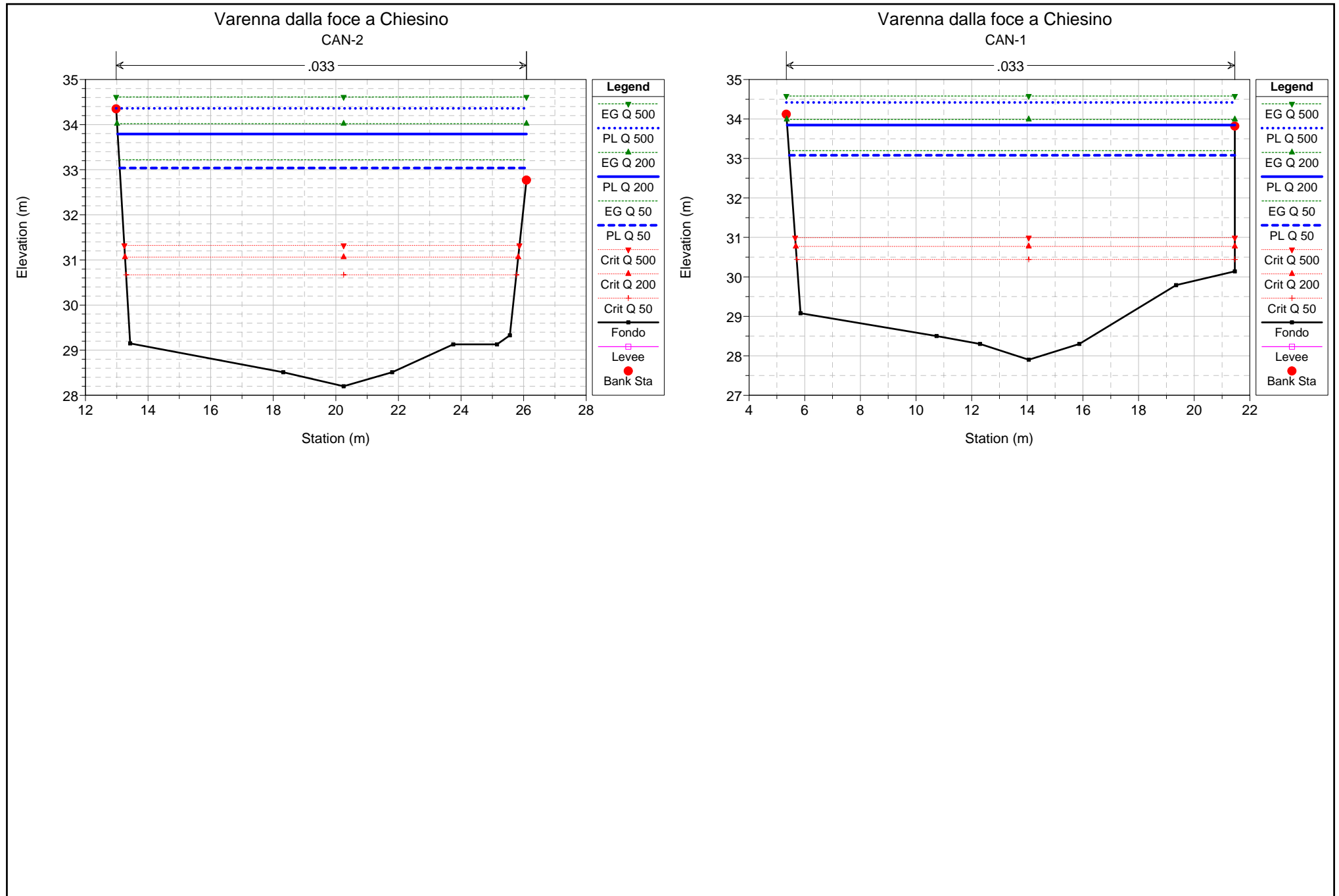
1 cm Horiz. = 10 m    1 cm Vert. = 1 m











HEC-RAS Plan: 06\_Cantalupo River: Cantalupo Reach: unico

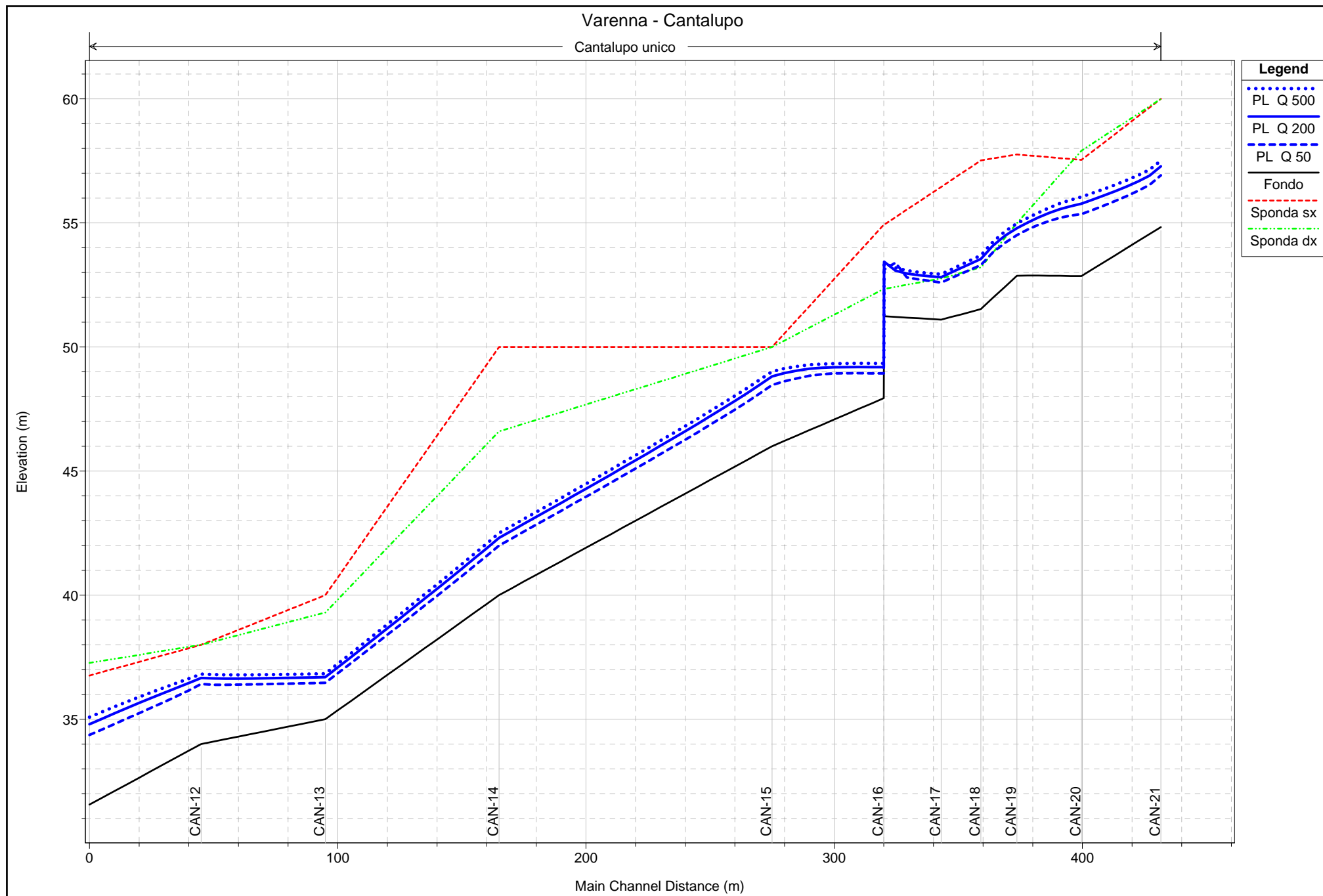
| Reach | River Sta |        | Profile | Q Total<br>(m3/s) | Min Ch El<br>(m) | W.S. Elev<br>(m) | LOB Elev<br>(m) | L. Freeboard<br>(m) | ROB Elev<br>(m) | R. Freeboard<br>(m) | Crit W.S.<br>(m) | E.G. Elev<br>(m) | E.G. Slope<br>(m/m) | Vel Chnl<br>(m/s) | Flow Area<br>(m2) | Top Width<br>(m) | Froude # Chl |
|-------|-----------|--------|---------|-------------------|------------------|------------------|-----------------|---------------------|-----------------|---------------------|------------------|------------------|---------------------|-------------------|-------------------|------------------|--------------|
| unico | 120       | CAN-11 | Q 50    | 102.00            | 31.56            | 35.01            | 36.76           | 1.75                | 37.27           | 2.26                | 35.01            | 36.12            | 0.011735            | 4.68              | 21.79             | 9.78             | 1.00         |
| unico | 120       | CAN-11 | Q 200   | 135.00            | 31.56            | 35.56            | 36.76           | 1.20                | 37.27           | 1.71                | 35.56            | 36.77            | 0.011538            | 4.86              | 27.78             | 11.55            | 1.00         |
| unico | 120       | CAN-11 | Q 500   | 158.00            | 31.56            | 35.85            | 36.76           | 0.91                | 37.27           | 1.42                | 35.85            | 37.16            | 0.011480            | 5.08              | 31.08             | 11.80            | 1.00         |
| unico | 110       | CAN-10 | Q 50    | 102.00            | 30.92            | 33.13            | 35.40           | 2.27                | 36.64           | 3.51                | 33.76            | 35.23            | 0.029029            | 6.42              | 15.88             | 9.60             | 1.59         |
| unico | 110       | CAN-10 | Q 200   | 135.00            | 30.92            | 33.52            | 35.40           | 1.88                | 36.64           | 3.12                | 34.23            | 35.91            | 0.027304            | 6.84              | 19.73             | 9.96             | 1.55         |
| unico | 110       | CAN-10 | Q 500   | 158.00            | 30.92            | 33.78            | 35.40           | 1.62                | 36.64           | 2.86                | 34.53            | 36.33            | 0.026200            | 7.06              | 22.37             | 10.19            | 1.52         |
| unico | 100       | CAN-9  | Q 50    | 102.00            | 30.43            | 32.44            | 35.40           | 2.96                | 36.28           | 3.84                | 33.13            | 34.61            | 0.036372            | 6.53              | 15.62             | 11.60            | 1.80         |
| unico | 100       | CAN-9  | Q 200   | 135.00            | 30.43            | 34.79            | 35.40           | 0.61                | 36.28           | 1.49                | 33.51            | 35.18            | 0.002495            | 2.76              | 48.92             | 15.55            | 0.50         |
| unico | 100       | CAN-9  | Q 500   | 158.00            | 30.43            | 35.54            | 35.40           | -0.14               | 36.28           | 0.74                | 33.76            | 35.88            | 0.001952            | 2.58              | 61.28             | 17.62            | 0.44         |
| unico | 90        | CAN-8  | Q 50    | 102.00            | 29.63            | 31.56            | 35.27           | 3.71                | 35.95           | 4.39                | 32.33            | 33.99            | 0.040642            | 6.90              | 14.77             | 10.93            | 1.90         |
| unico | 90        | CAN-8  | Q 200   | 135.00            | 29.63            | 34.88            | 35.27           | 0.39                | 35.95           | 1.07                | 32.79            | 35.10            | 0.001223            | 2.07              | 65.34             | 18.89            | 0.35         |
| unico | 90        | CAN-8  | Q 500   | 158.00            | 29.63            | 35.62            | 35.27           | -0.35               | 35.95           | 0.33                | 33.05            | 35.82            | 0.000959            | 1.98              | 79.62             | 19.66            | 0.31         |
| unico | 80        | CAN-7  | Q 50    | 102.00            | 29.16            | 33.25            | 35.23           | 1.98                | 35.59           | 2.34                | 31.91            | 33.49            | 0.001849            | 2.20              | 46.33             | 16.71            | 0.42         |
| unico | 80        | CAN-7  | Q 200   | 135.00            | 29.16            | 34.90            | 35.23           | 0.33                | 35.59           | 0.69                | 32.25            | 35.06            | 0.000834            | 1.78              | 75.84             | 18.93            | 0.28         |
| unico | 80        | CAN-7  | Q 500   | 158.00            | 29.16            | 35.63            | 35.23           | -0.40               | 35.59           | -0.04               | 32.47            | 35.79            | 0.000703            | 1.76              | 89.67             | 18.99            | 0.26         |
| unico | 70        | CAN-6  | Q 50    | 102.00            | 29.09            | 33.26            | 34.84           | 1.58                | 35.52           | 2.26                | 31.49            | 33.47            | 0.001250            | 1.99              | 51.18             | 15.12            | 0.35         |
| unico | 70        | CAN-6  | Q 200   | 135.00            | 29.09            | 34.90            | 34.84           | -0.06               | 35.52           | 0.62                | 31.84            | 35.05            | 0.000696            | 1.73              | 77.99             | 16.64            | 0.26         |
| unico | 70        | CAN-6  | Q 500   | 158.00            | 29.09            | 35.62            | 34.84           | -0.78               | 35.52           | -0.10               | 32.07            | 35.78            | 0.000637            | 1.75              | 90.07             | 16.70            | 0.24         |
| unico | 60        | CAN-5  | Q 50    | 102.00            | 28.78            | 33.15            | 35.46           | 2.31                | 35.93           | 2.78                | 31.37            | 33.44            | 0.001901            | 2.38              | 42.85             | 11.40            | 0.39         |
| unico | 60        | CAN-5  | Q 200   | 135.00            | 28.78            | 34.79            | 35.46           | 0.67                | 35.93           | 1.14                | 31.79            | 35.03            | 0.001238            | 2.19              | 61.72             | 11.67            | 0.30         |
| unico | 60        | CAN-5  | Q 500   | 158.00            | 28.78            | 35.50            | 35.46           | -0.04               | 35.93           | 0.43                | 32.05            | 35.76            | 0.001212            | 2.25              | 70.08             | 11.79            | 0.30         |
| unico | 51        | CAN-5  |         | Bridge            |                  |                  |                 |                     |                 |                     |                  |                  |                     |                   |                   |                  |              |
| unico | 50        | CAN-5  | Q 50    | 102.00            | 28.85            | 32.97            | 34.36           | 1.39                | 35.65           | 2.68                | 31.43            | 33.31            | 0.002478            | 2.57              | 39.71             | 11.10            | 0.43         |
| unico | 50        | CAN-5  | Q 200   | 135.00            | 28.85            | 33.71            | 34.36           | 0.65                | 35.65           | 1.94                | 31.85            | 34.11            | 0.002578            | 2.82              | 47.93             | 11.14            | 0.43         |
| unico | 50        | CAN-5  | Q 500   | 158.00            | 28.85            | 34.27            | 34.36           | 0.09                | 35.65           | 1.38                | 32.13            | 34.71            | 0.002524            | 2.91              | 54.22             | 11.17            | 0.42         |
| unico | 49        | CAN-4  | Q 50    | 102.00            | 28.85            | 32.97            | 34.36           | 1.39                | 32.85           | -0.12               | 31.40            | 33.28            | 0.002287            | 2.50              | 40.83             | 11.48            | 0.42         |
| unico | 49        | CAN-4  | Q 200   | 135.00            | 28.85            | 33.71            | 34.36           | 0.65                | 32.85           | -0.86               | 31.81            | 34.09            | 0.002249            | 2.74              | 49.34             | 11.48            | 0.42         |
| unico | 49        | CAN-4  | Q 500   | 158.00            | 28.85            | 34.27            | 34.36           | 0.09                | 32.85           | -1.42               | 32.09            | 34.68            | 0.002121            | 2.83              | 55.84             | 11.48            | 0.41         |
| unico | 40        | CAN-3  | Q 50    | 102.00            | 28.56            | 33.01            | 34.34           | 1.33                | 38.85           | 5.84                | 30.98            | 33.25            | 0.001496            | 2.17              | 47.06             | 11.99            | 0.35         |
| unico | 40        | CAN-3  | Q 200   | 135.00            | 28.56            | 33.75            | 34.34           | 0.59                | 38.85           | 5.10                | 31.39            | 34.05            | 0.001623            | 2.41              | 56.03             | 12.05            | 0.36         |
| unico | 40        | CAN-3  | Q 500   | 158.00            | 28.56            | 34.32            | 34.34           | 0.02                | 38.85           | 4.53                | 31.66            | 34.64            | 0.001629            | 2.51              | 62.87             | 12.10            | 0.35         |
| unico | 30        | CAN-2  | Q 50    | 102.00            | 28.20            | 33.04            | 34.35           | 1.31                | 32.77           | -0.27               | 30.67            | 33.22            | 0.001044            | 1.89              | 53.86             | 13.00            | 0.30         |
| unico | 30        | CAN-2  | Q 200   | 135.00            | 28.20            | 33.79            | 34.35           | 0.56                | 32.77           | -1.02               | 31.06            | 34.02            | 0.001154            | 2.12              | 63.66             | 13.06            | 0.31         |
| unico | 30        | CAN-2  | Q 500   | 158.00            | 28.20            | 34.36            | 34.35           | -0.01               | 32.77           | -1.59               | 31.32            | 34.61            | 0.001171            | 2.22              | 71.11             | 13.11            | 0.30         |
| unico | 20        | CAN-1  | Q 50    | 102.00            | 27.90            | 33.08            | 34.12           | 1.04                | 33.82           | 0.74                | 30.44            | 33.20            | 0.000593            | 1.51              | 67.51             | 16.01            | 0.23         |
| unico | 20        | CAN-1  | Q 200   | 135.00            | 27.90            | 33.84            | 34.12           | 0.28                | 33.82           | -0.02               | 30.77            | 33.99            | 0.000782            | 1.69              | 79.76             | 16.09            | 0.24         |
| unico | 20        | CAN-1  | Q 500   | 158.00            | 27.90            | 34.42            | 34.12           | -0.30               | 33.82           | -0.60               | 30.99            | 34.58            | 0.000783            | 1.77              | 89.02             | 16.12            | 0.24         |

*Piano di Bacino Stralcio del torrente Varenna*  
Verifiche idrauliche

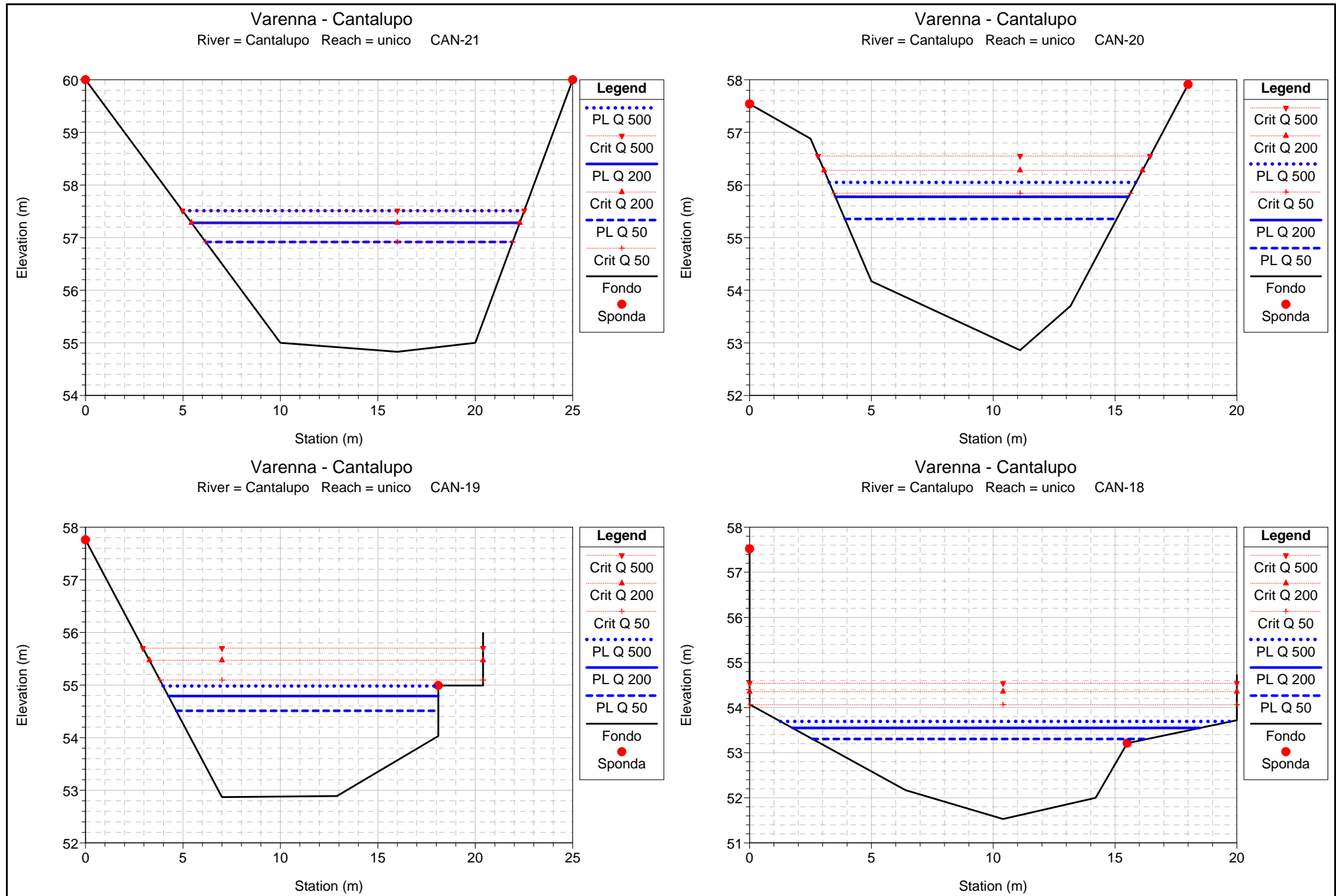
## **Rio Cantalupo**

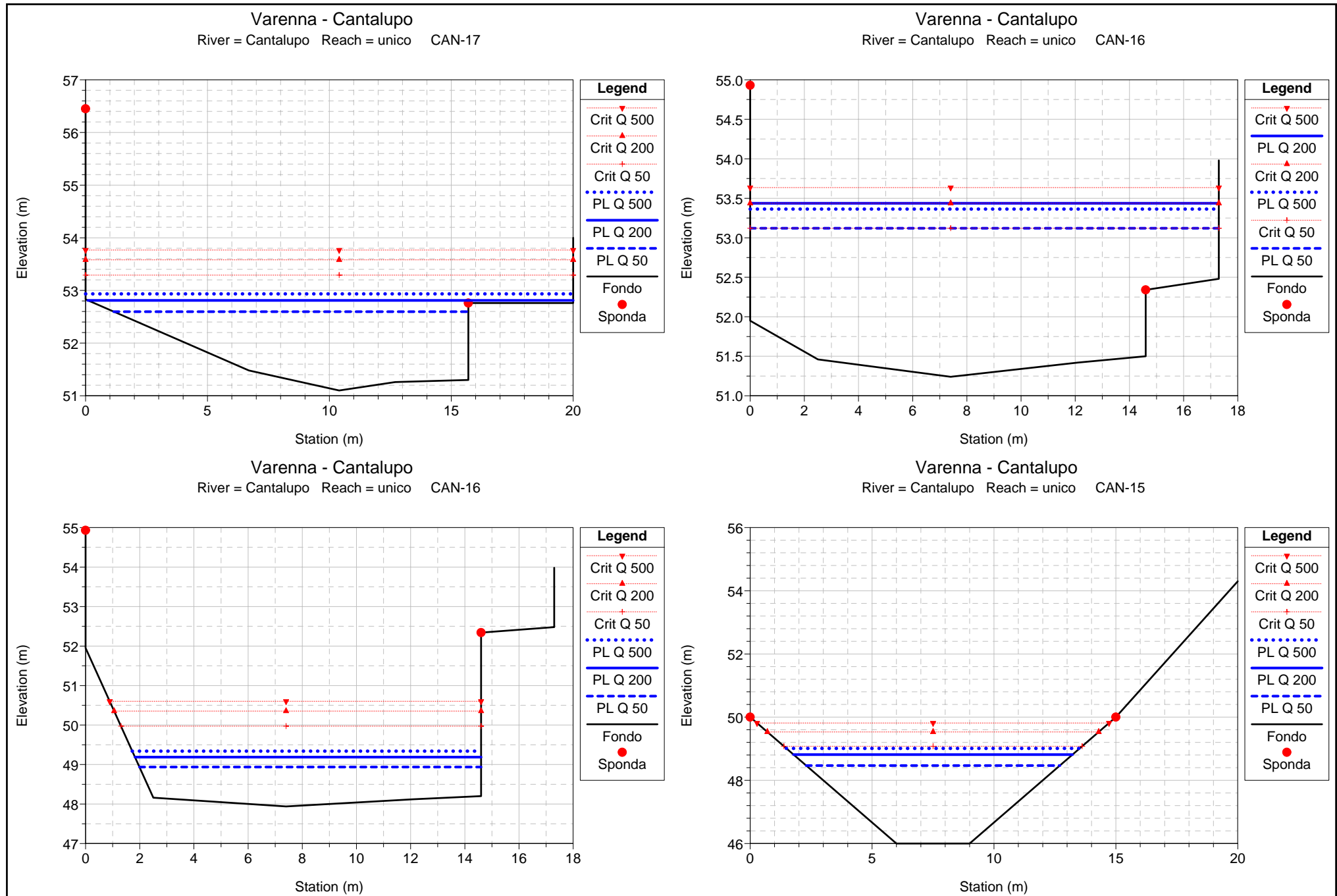
Tratto di monte - dalla sezione CAN 21 alla CAN11

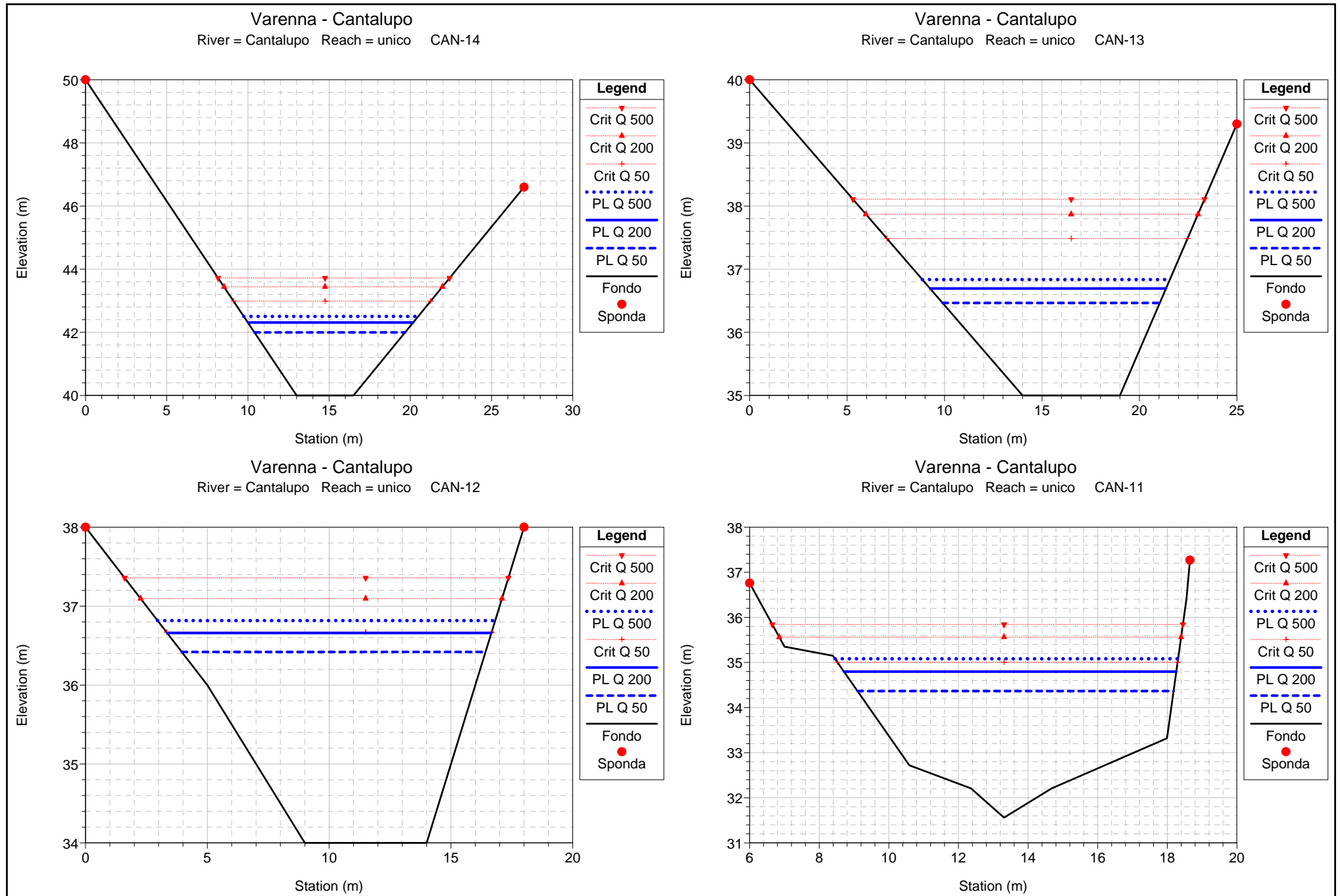
- Profili di corrente
- Sezioni idrauliche
- Tabelle dei risultati



1 cm Horiz. = 20 m 1 cm Vert. = 2 m







HEC-RAS Plan: Rev. 2 River: Cantalupo Reach: unico

| Reach | River Sta |        | Q Total<br>(m3/s) | Min Ch El<br>(m) | W.S. Elev<br>(m) | LOB Elev<br>(m) | L. Freeboard<br>(m) | ROB Elev<br>(m) | R. Freeboard<br>(m) | Crit W.S.<br>(m) | E.G. Elev<br>(m) | E.G. Slope<br>(m/m) | Vel Chnl<br>(m/s) | Flow Area<br>(m2) | Top Width<br>(m) | Froude # Chl |
|-------|-----------|--------|-------------------|------------------|------------------|-----------------|---------------------|-----------------|---------------------|------------------|------------------|---------------------|-------------------|-------------------|------------------|--------------|
| unico | 14        | CAN-21 | 102.00            | 54.83            | 56.92            | 60.00           | 3.08                | 60.00           | 3.08                | 56.92            | 57.73            | 0.010095            | 3.99              | 25.54             | 15.75            | 1.00         |
| unico | 14        | CAN-21 | 135.00            | 54.83            | 57.28            | 60.00           | 2.72                | 60.00           | 2.72                | 57.28            | 58.22            | 0.009741            | 4.29              | 31.48             | 16.85            | 1.00         |
| unico | 14        | CAN-21 | 158.00            | 54.83            | 57.51            | 60.00           | 2.49                | 60.00           | 2.49                | 57.51            | 58.52            | 0.009553            | 4.46              | 35.43             | 17.53            | 1.00         |
| unico | 13        | CAN-20 | 102.00            | 52.86            | 55.35            | 57.54           | 2.19                | 57.91           | 2.56                | 55.84            | 57.04            | 0.022851            | 5.75              | 17.73             | 11.16            | 1.46         |
| unico | 13        | CAN-20 | 135.00            | 52.86            | 55.78            | 57.54           | 1.76                | 57.91           | 2.13                | 56.28            | 57.59            | 0.020118            | 5.97              | 22.61             | 12.03            | 1.39         |
| unico | 13        | CAN-20 | 158.00            | 52.86            | 56.05            | 57.54           | 1.49                | 57.91           | 1.86                | 56.55            | 57.93            | 0.018649            | 6.08              | 26.00             | 12.60            | 1.35         |
| unico | 12        | CAN-19 | 102.00            | 52.87            | 54.51            | 57.76           | 3.25                | 54.99           | 0.48                | 55.10            | 56.34            | 0.031846            | 6.00              | 17.01             | 13.45            | 1.70         |
| unico | 12        | CAN-19 | 135.00            | 52.87            | 54.79            | 57.76           | 2.97                | 54.99           | 0.20                | 55.47            | 56.93            | 0.030444            | 6.48              | 20.82             | 13.85            | 1.69         |
| unico | 12        | CAN-19 | 158.00            | 52.87            | 54.98            | 57.76           | 2.78                | 54.99           | 0.01                | 55.70            | 57.29            | 0.029204            | 6.73              | 23.48             | 14.12            | 1.67         |
| unico | 11        | CAN-18 | 102.00            | 51.53            | 53.30            | 57.52           | 4.22                | 53.21           | -0.09               | 54.06            | 55.75            | 0.047149            | 6.93              | 14.76             | 13.74            | 2.07         |
| unico | 11        | CAN-18 | 135.00            | 51.53            | 53.55            | 57.52           | 3.97                | 53.21           | -0.34               | 54.35            | 56.35            | 0.045254            | 7.45              | 18.50             | 16.73            | 2.08         |
| unico | 11        | CAN-18 | 158.00            | 51.53            | 53.69            | 57.52           | 3.83                | 53.21           | -0.48               | 54.54            | 56.72            | 0.044615            | 7.76              | 21.07             | 18.50            | 2.09         |
| unico | 10        | CAN-17 | 102.00            | 51.10            | 52.60            | 56.45           | 3.85                | 52.76           | 0.16                | 53.29            | 54.91            | 0.053057            | 6.74              | 15.14             | 14.54            | 2.11         |
| unico | 10        | CAN-17 | 135.00            | 51.10            | 52.81            | 56.45           | 3.64                | 52.76           | -0.05               | 53.58            | 55.55            | 0.053758            | 7.34              | 18.60             | 19.91            | 2.16         |
| unico | 10        | CAN-17 | 158.00            | 51.10            | 52.93            | 56.45           | 3.52                | 52.76           | -0.17               | 53.77            | 55.93            | 0.052678            | 7.70              | 21.06             | 20.00            | 2.16         |
| unico | 9.1       | CAN-16 | 102.00            | 51.24            | 53.12            | 54.93           | 1.81                | 52.34           | -0.78               | 53.12            | 53.89            | 0.010041            | 3.95              | 26.69             | 17.30            | 0.97         |
| unico | 9.1       | CAN-16 | 135.00            | 51.24            | 53.44            | 54.93           | 1.49                | 52.34           | -1.10               | 53.44            | 54.37            | 0.009940            | 4.36              | 32.17             | 17.30            | 0.98         |
| unico | 9.1       | CAN-16 | 158.00            | 51.24            | 53.36            | 54.93           | 1.57                | 52.34           | -1.02               | 53.64            | 54.75            | 0.015402            | 5.30              | 30.90             | 17.30            | 1.22         |
| unico | 9         | CAN-16 | 102.00            | 47.94            | 48.94            | 54.93           | 5.99                | 52.34           | 3.40                | 49.97            | 53.51            | 0.135922            | 9.48              | 10.76             | 12.61            | 3.27         |
| unico | 9         | CAN-16 | 135.00            | 47.94            | 49.19            | 54.93           | 5.74                | 52.34           | 3.15                | 50.35            | 53.98            | 0.106554            | 9.70              | 13.91             | 12.78            | 2.97         |
| unico | 9         | CAN-16 | 158.00            | 47.94            | 49.34            | 54.93           | 5.59                | 52.34           | 3.00                | 50.60            | 54.38            | 0.096848            | 9.95              | 15.88             | 12.88            | 2.86         |
| unico | 8         | CAN-15 | 102.00            | 46.00            | 48.47            | 50.00           | 1.53                | 50.00           | 1.53                | 49.08            | 50.40            | 0.026661            | 6.16              | 16.55             | 10.41            | 1.56         |
| unico | 8         | CAN-15 | 135.00            | 46.00            | 48.82            | 50.00           | 1.18                | 50.00           | 1.18                | 49.53            | 51.06            | 0.026833            | 6.64              | 20.34             | 11.45            | 1.59         |
| unico | 8         | CAN-15 | 158.00            | 46.00            | 49.01            | 50.00           | 0.99                | 50.00           | 0.99                | 49.81            | 51.49            | 0.027567            | 6.98              | 22.64             | 12.04            | 1.62         |
| unico | 7         | CAN-14 | 102.00            | 40.00            | 42.00            | 50.00           | 8.00                | 46.60           | 4.60                | 42.99            | 45.25            | 0.053742            | 7.99              | 12.77             | 9.28             | 2.17         |
| unico | 7         | CAN-14 | 135.00            | 40.00            | 42.31            | 50.00           | 7.69                | 46.60           | 4.29                | 43.44            | 46.03            | 0.052855            | 8.55              | 15.80             | 10.18            | 2.19         |
| unico | 7         | CAN-14 | 158.00            | 40.00            | 42.50            | 50.00           | 7.50                | 46.60           | 4.10                | 43.72            | 46.51            | 0.052290            | 8.87              | 17.82             | 10.74            | 2.20         |
| unico | 6         | CAN-13 | 102.00            | 35.00            | 36.46            | 40.00           | 3.54                | 39.30           | 2.84                | 37.48            | 40.26            | 0.081441            | 8.63              | 11.82             | 11.15            | 2.67         |
| unico | 6         | CAN-13 | 135.00            | 35.00            | 36.69            | 40.00           | 3.31                | 39.30           | 2.61                | 37.87            | 41.12            | 0.081448            | 9.32              | 14.48             | 12.10            | 2.72         |
| unico | 6         | CAN-13 | 158.00            | 35.00            | 36.84            | 40.00           | 3.16                | 39.30           | 2.46                | 38.11            | 41.65            | 0.081249            | 9.72              | 16.25             | 12.70            | 2.74         |
| unico | 5         | CAN-12 | 102.00            | 34.00            | 36.42            | 38.00           | 1.58                | 38.00           | 1.58                | 36.67            | 37.63            | 0.015182            | 4.88              | 20.92             | 12.47            | 1.20         |
| unico | 5         | CAN-12 | 135.00            | 34.00            | 36.66            | 38.00           | 1.34                | 38.00           | 1.34                | 37.10            | 38.27            | 0.018394            | 5.62              | 24.01             | 13.31            | 1.34         |
| unico | 5         | CAN-12 | 158.00            | 34.00            | 36.82            | 38.00           | 1.18                | 38.00           | 1.18                | 37.36            | 38.68            | 0.020049            | 6.04              | 26.15             | 13.86            | 1.40         |
| unico | 0         | CAN-11 | 102.00            | 31.56            | 34.37            | 36.76           | 2.39                | 37.27           | 2.90                | 35.01            | 36.50            | 0.029334            | 6.48              | 15.74             | 9.08             | 1.57         |
| unico | 0         | CAN-11 | 135.00            | 31.56            | 34.80            | 36.76           | 1.96                | 37.27           | 2.47                | 35.56            | 37.17            | 0.027025            | 6.83              | 19.76             | 9.55             | 1.52         |
| unico | 0         | CAN-11 | 158.00            | 31.56            | 35.08            | 36.76           | 1.68                | 37.27           | 2.19                | 35.84            | 37.59            | 0.025706            | 7.02              | 22.52             | 9.86             | 1.48         |



*Piano di Bacino Stralcio del torrente Varenna*  
Verifiche idrauliche

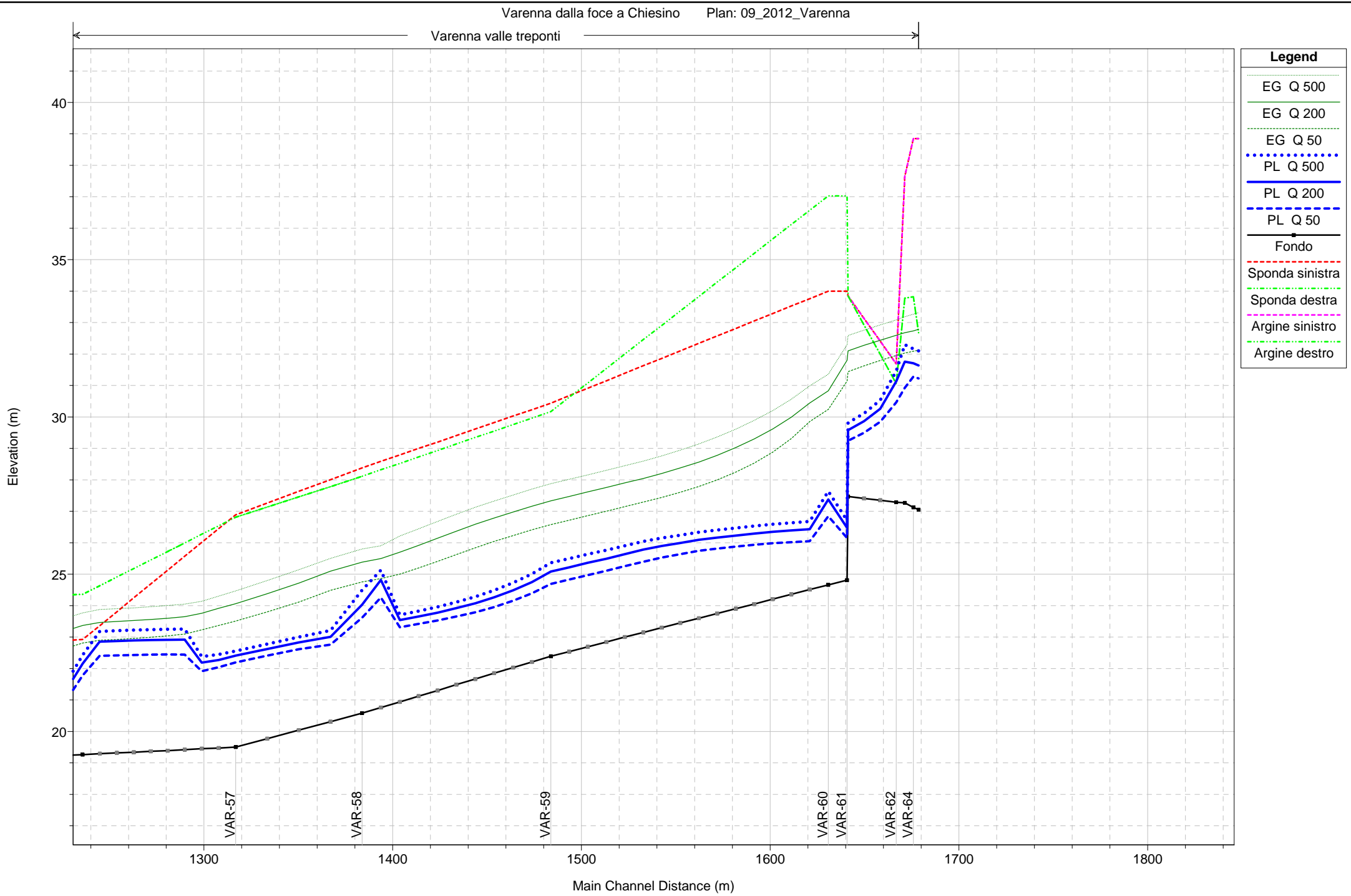
## **Torrente Varenna**

Tratto 3 - dalla sezione VAR65 alla VAR1  
dalla confl. con il Cantalupo alla foce

- Profili di corrente
- Sezioni idrauliche
- Tabelle dei risultati

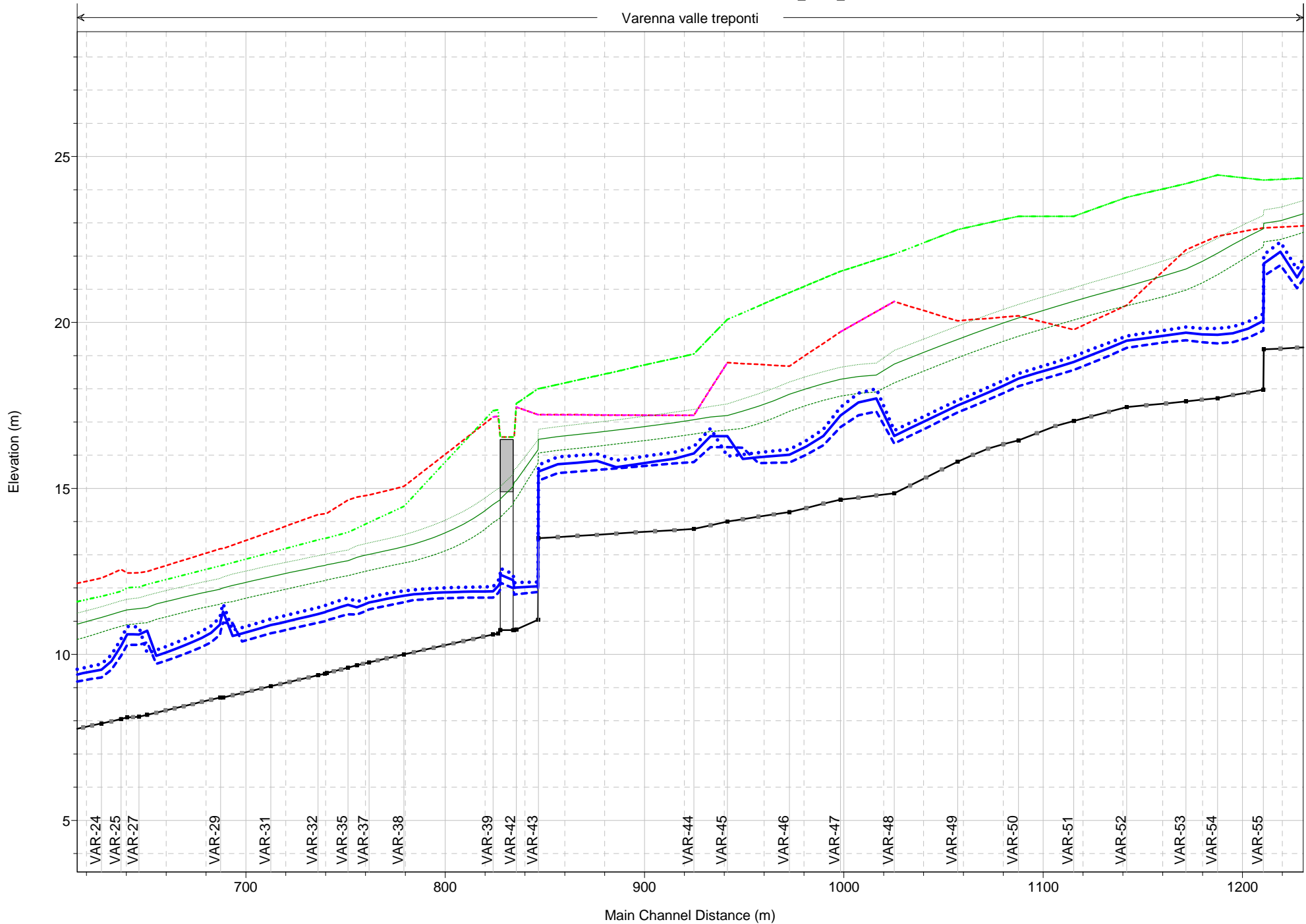
Varenna dalla foce a Chiesino Plan: 09\_2012\_Varenna

Varenna valle treponti



Varenna dalla foce a Chiesino Plan: 09\_2012\_Varenna

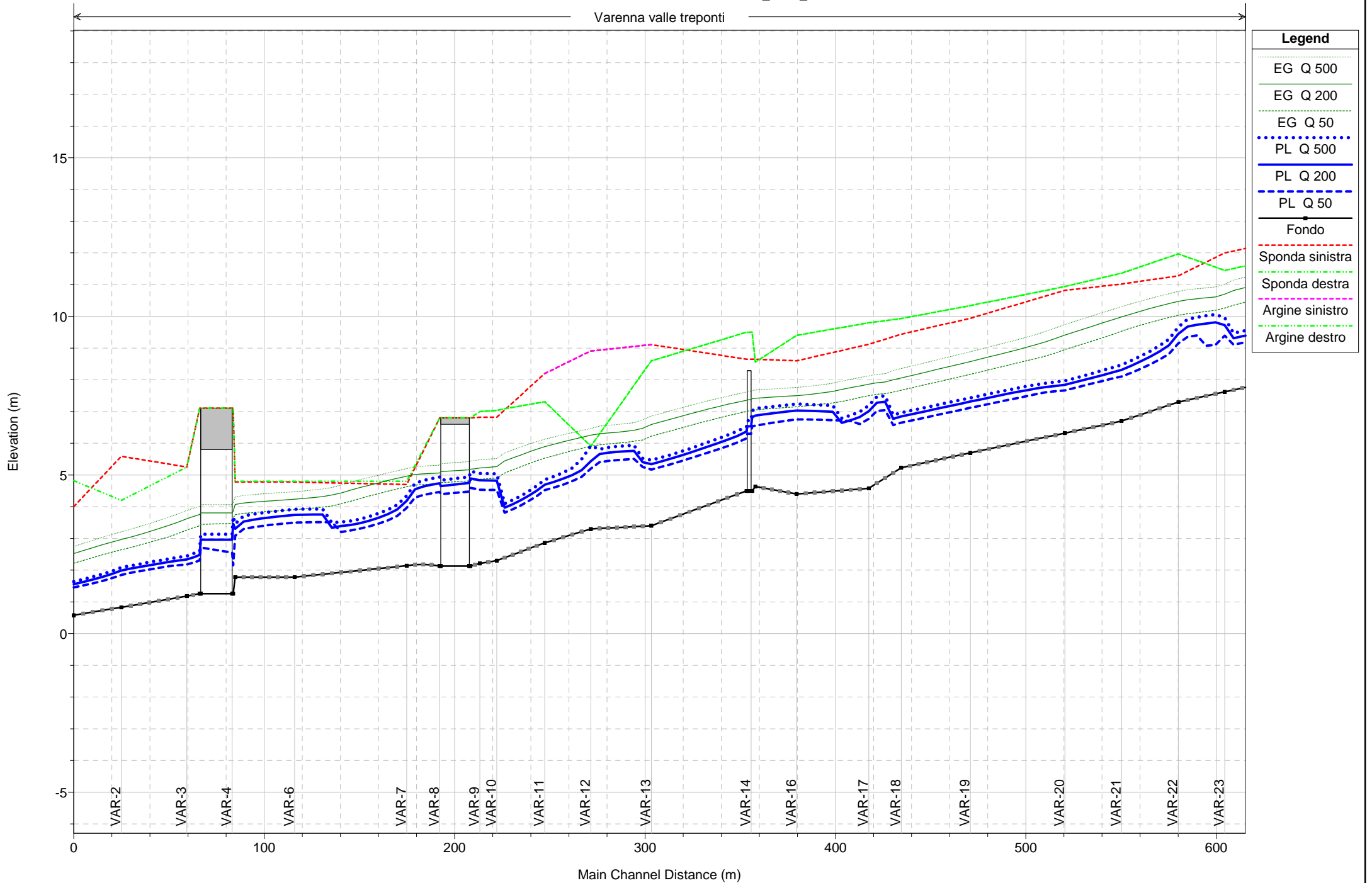
Varenna valle treponti



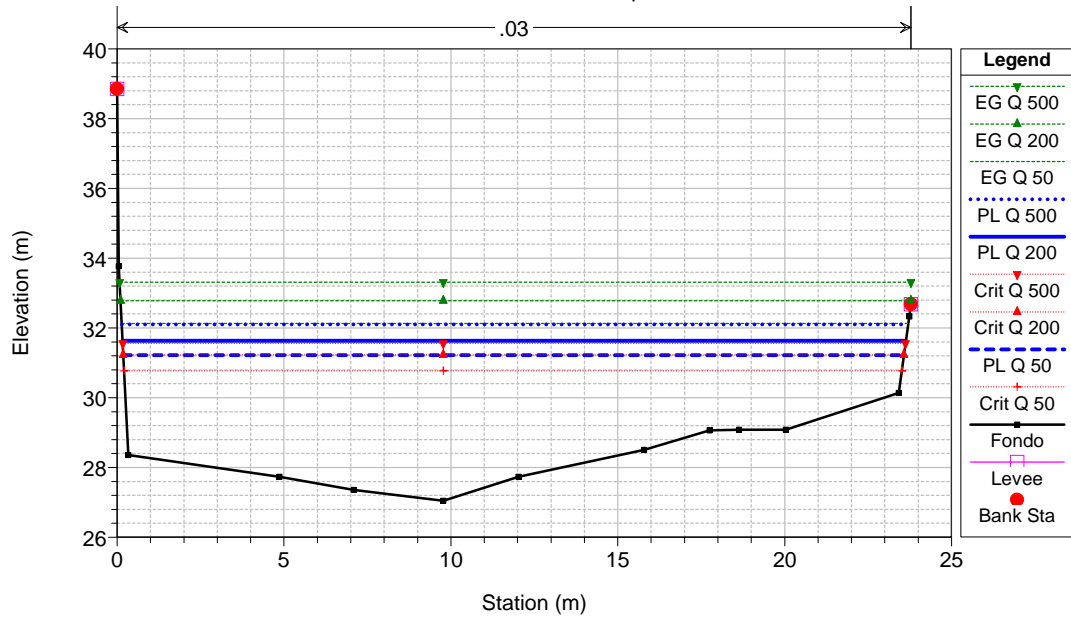
| Legend          |                                 |
|-----------------|---------------------------------|
| EG Q 500        | (Solid green line)              |
| EG Q 200        | (Dashed green line)             |
| EG Q 50         | (Dotted green line)             |
| PL Q 500        | (Dotted blue line)              |
| PL Q 200        | (Solid blue line)               |
| PL Q 50         | (Dashed blue line)              |
| Fondo           | (Solid black line with markers) |
| Sponda sinistra | (Dashed red line)               |
| Sponda destra   | (Dotted green line)             |
| Argine sinistro | (Dotted magenta line)           |
| Argine destro   | (Dotted green line)             |

Varenna dalla foce a Chiesino Plan: 09\_2012\_Varenna

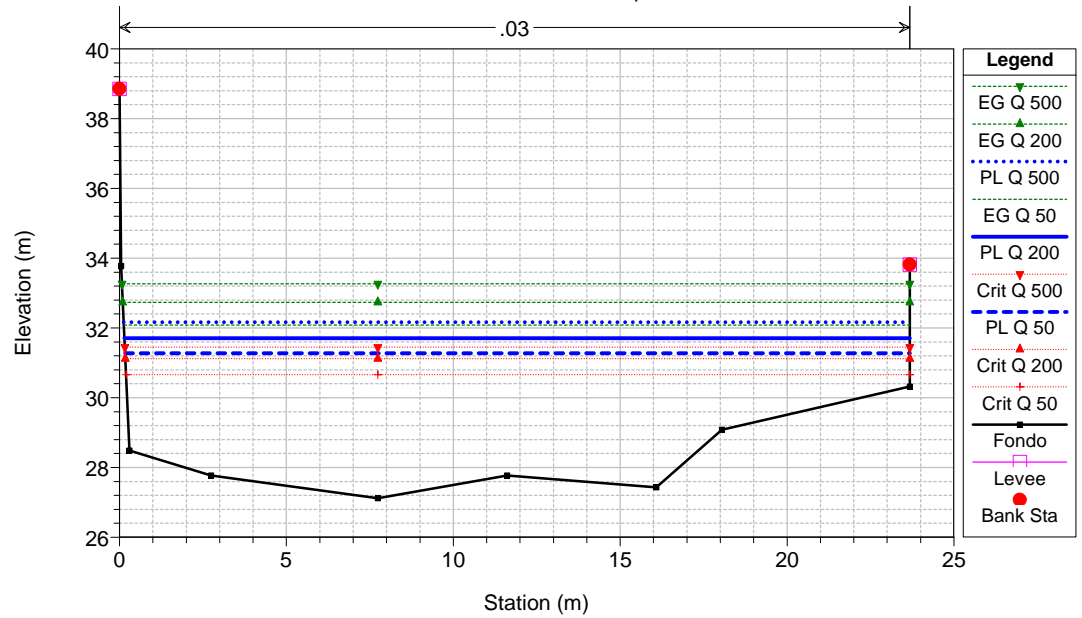
Varenna valle treponti



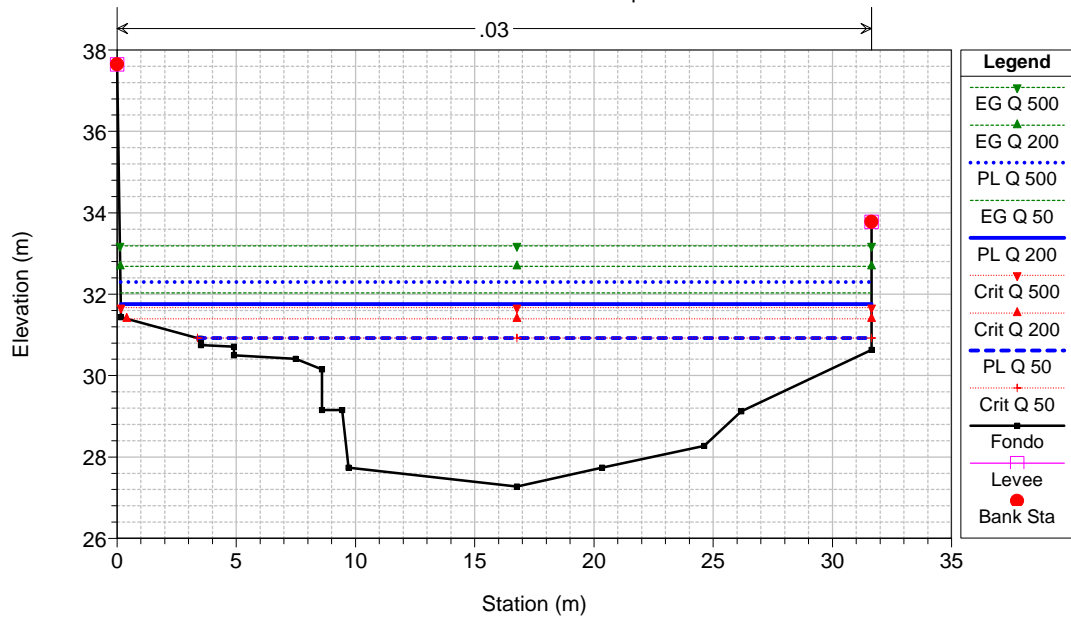
Varenna dalla foce a Chiesino  
River = Varenna Reach = valle treponti VAR-65



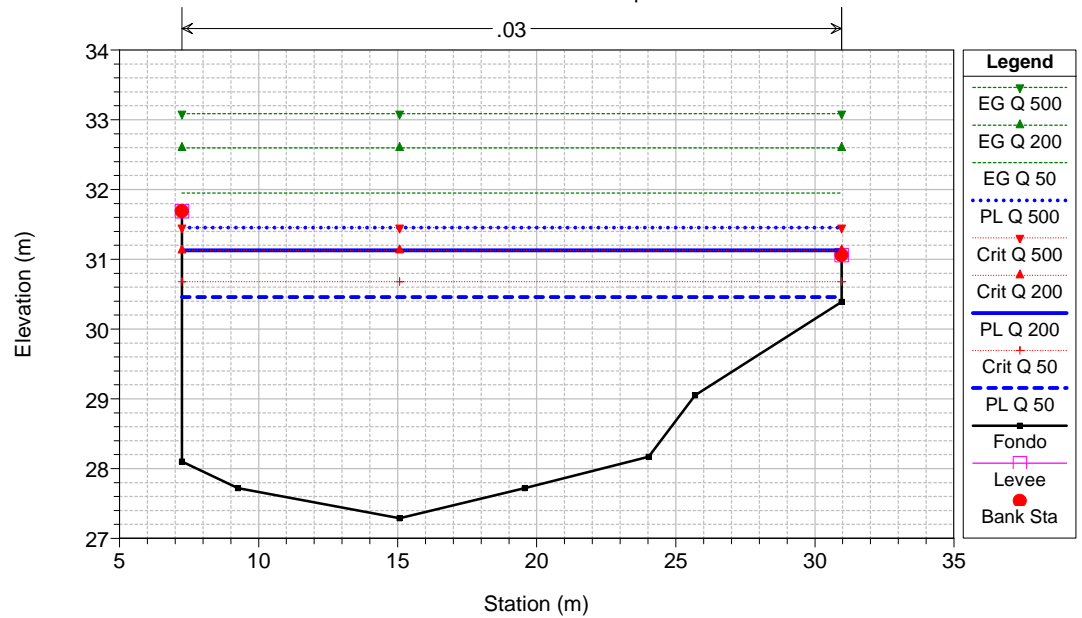
Varenna dalla foce a Chiesino  
River = Varenna Reach = valle treponti VAR-64

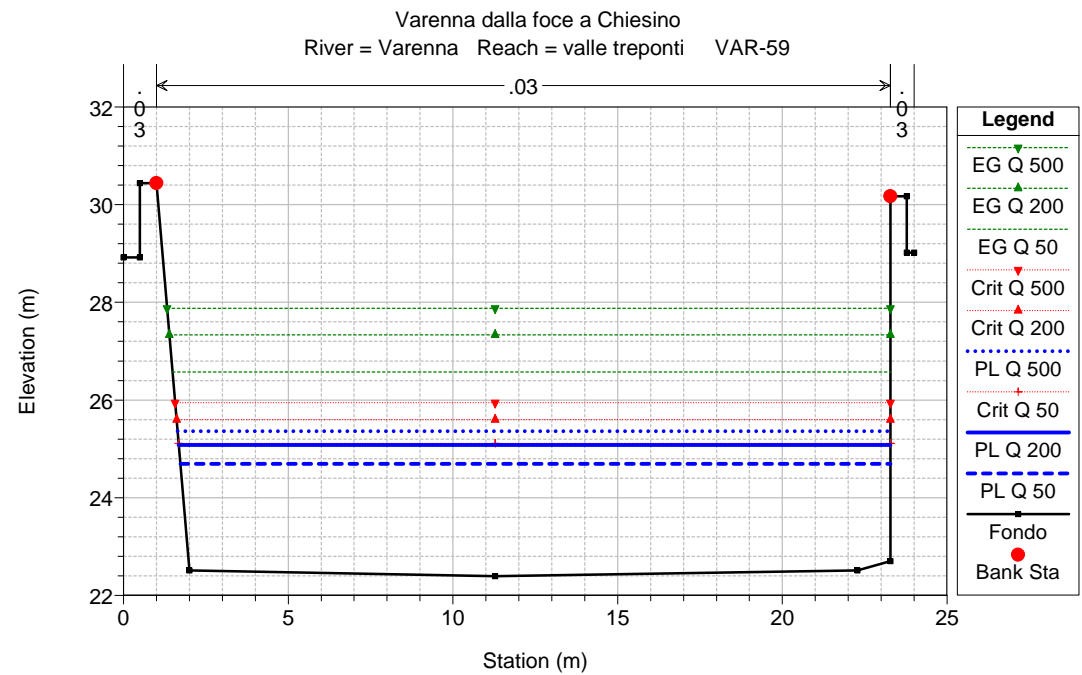
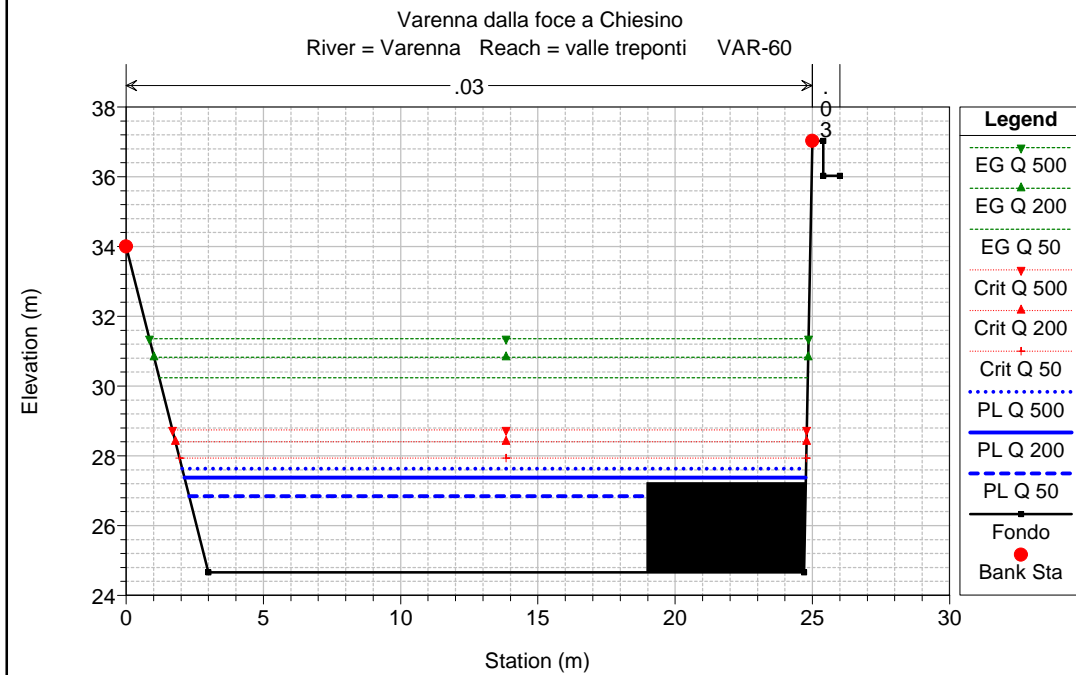
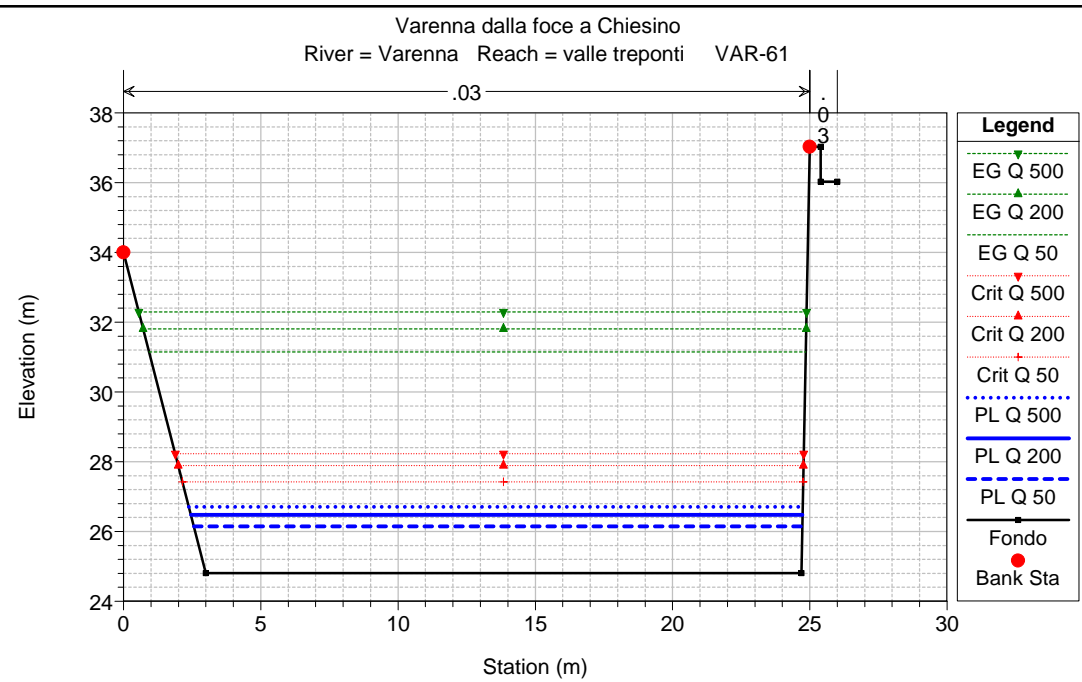
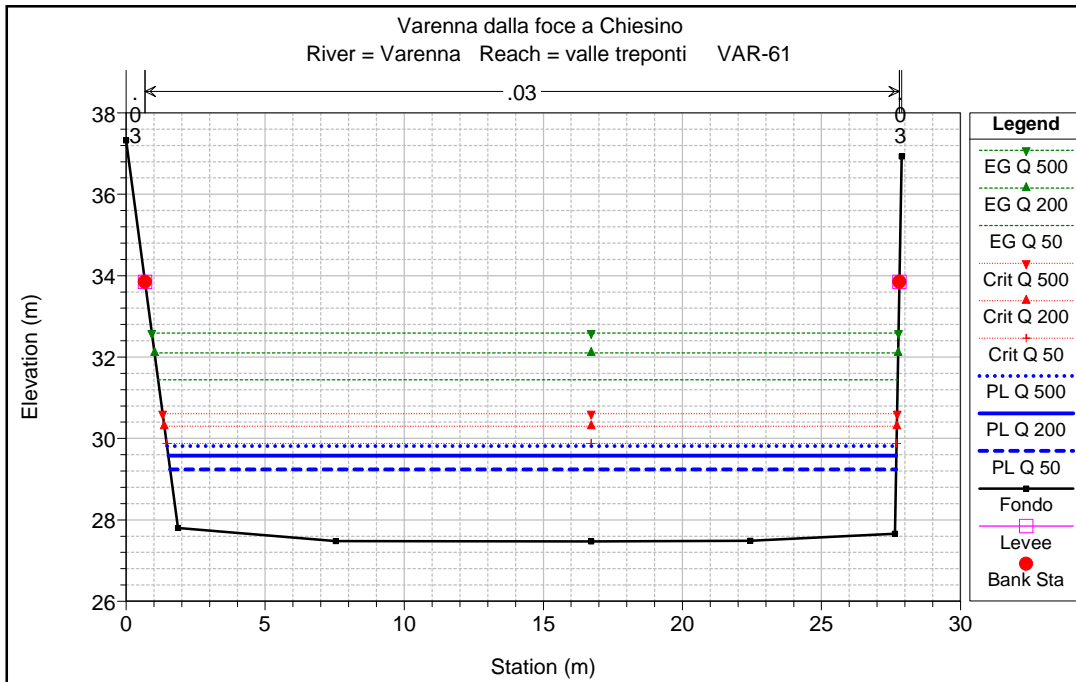


Varenna dalla foce a Chiesino  
River = Varenna Reach = valle treponti VAR-63

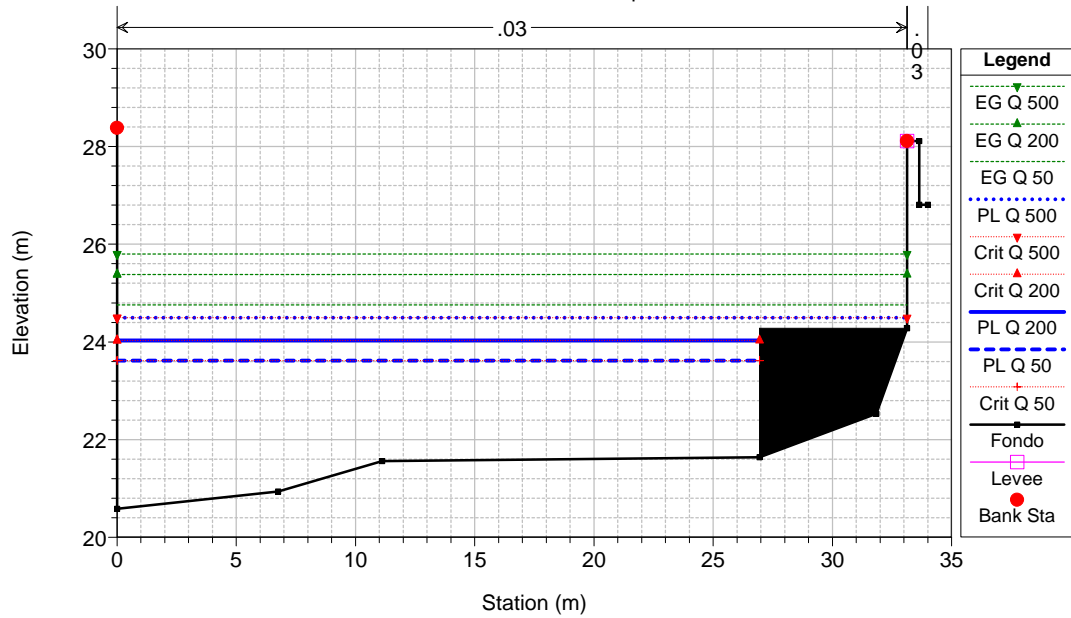


Varenna dalla foce a Chiesino  
River = Varenna Reach = valle treponti VAR-62

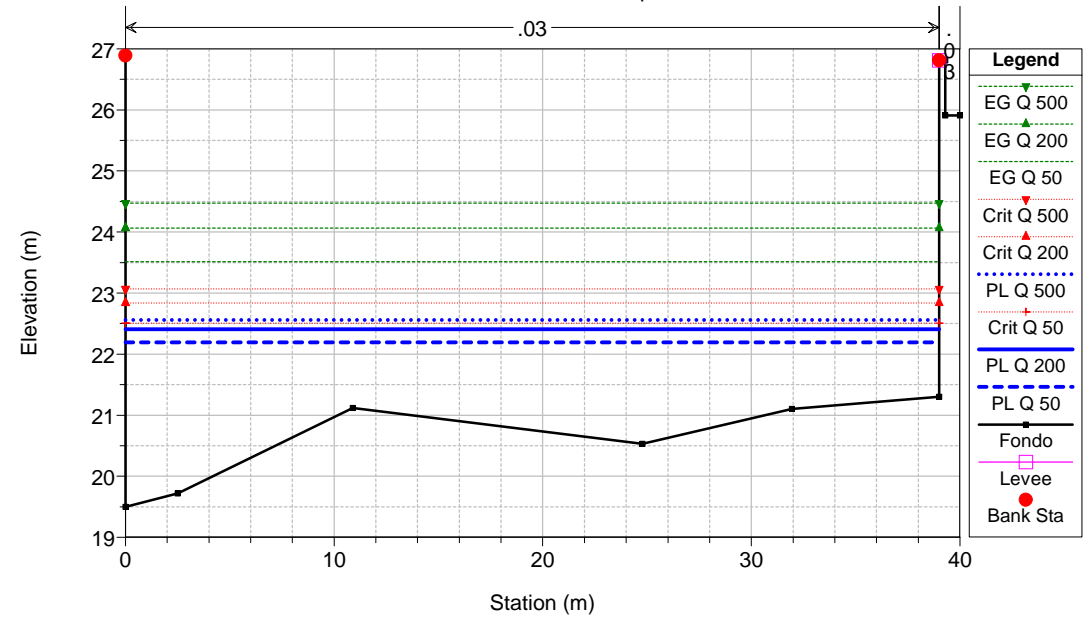




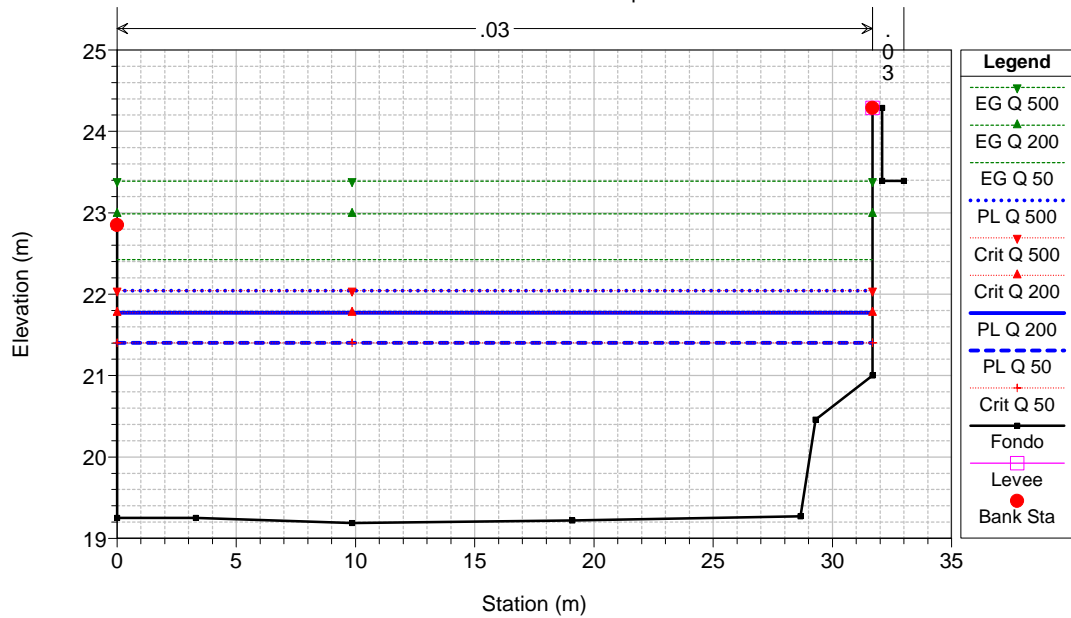
Varenna dalla foce a Chiesino  
River = Varenna Reach = valle treponti VAR-58



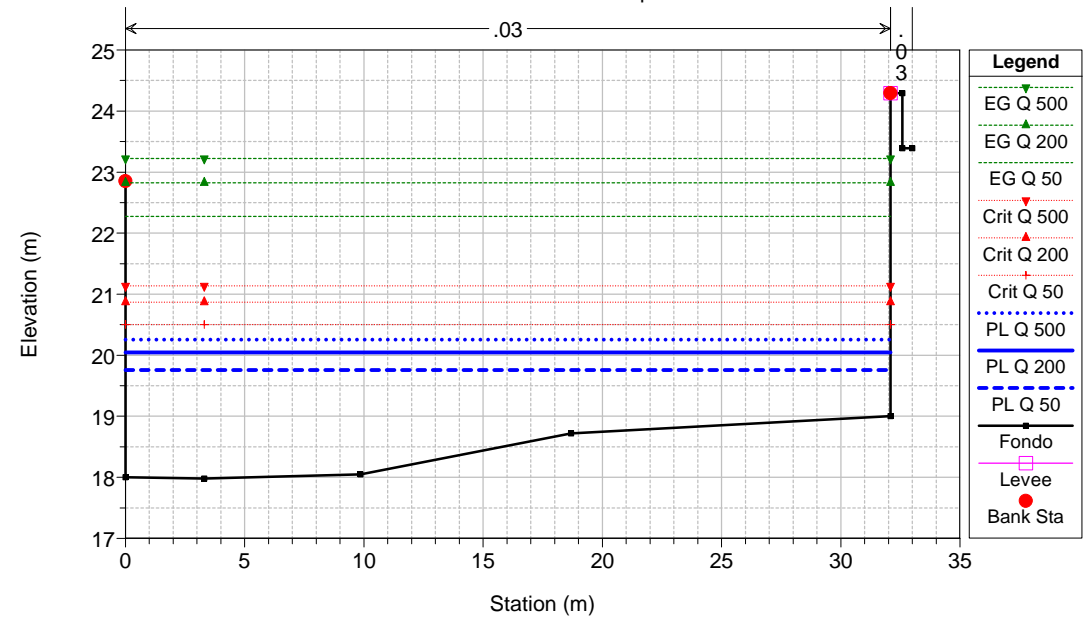
Varenna dalla foce a Chiesino  
River = Varenna Reach = valle treponti VAR-57

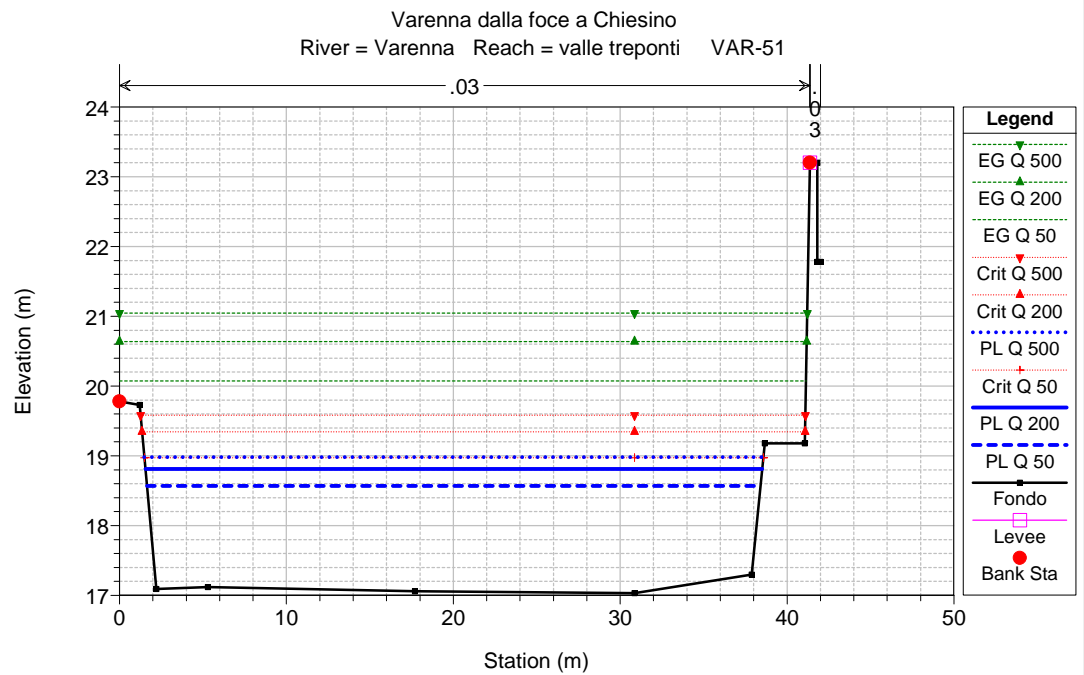
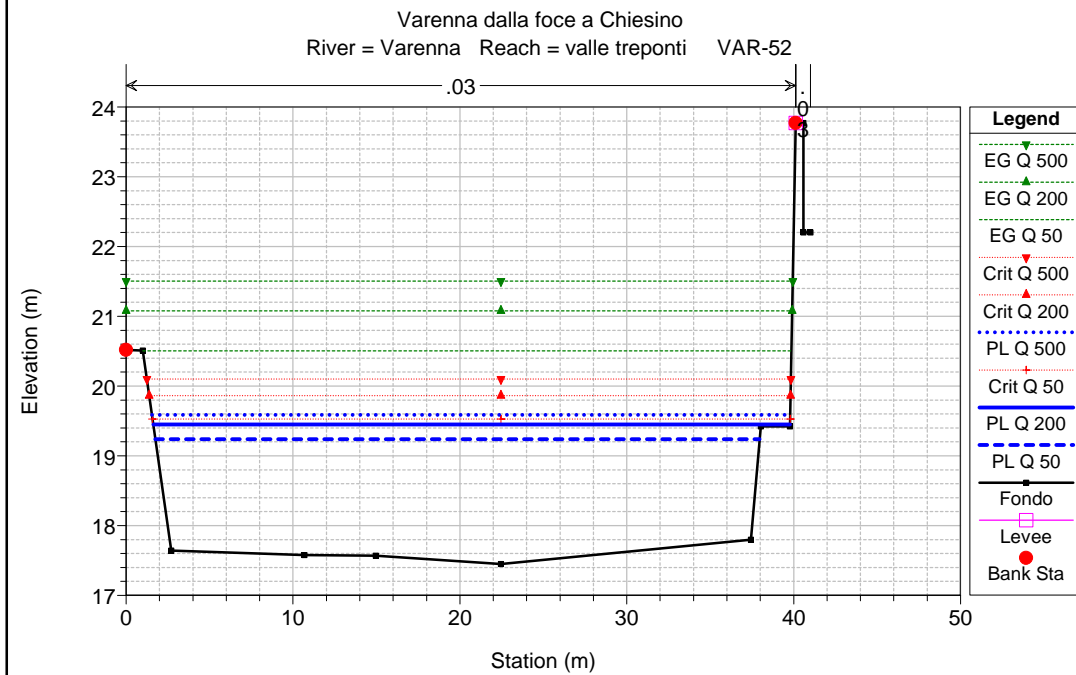
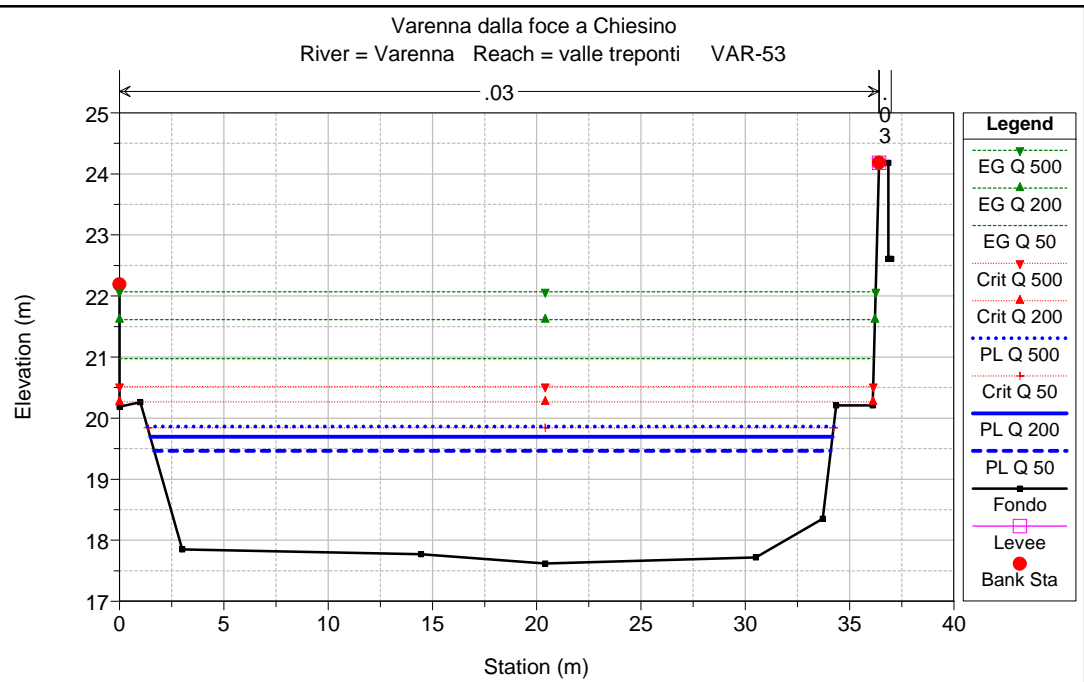
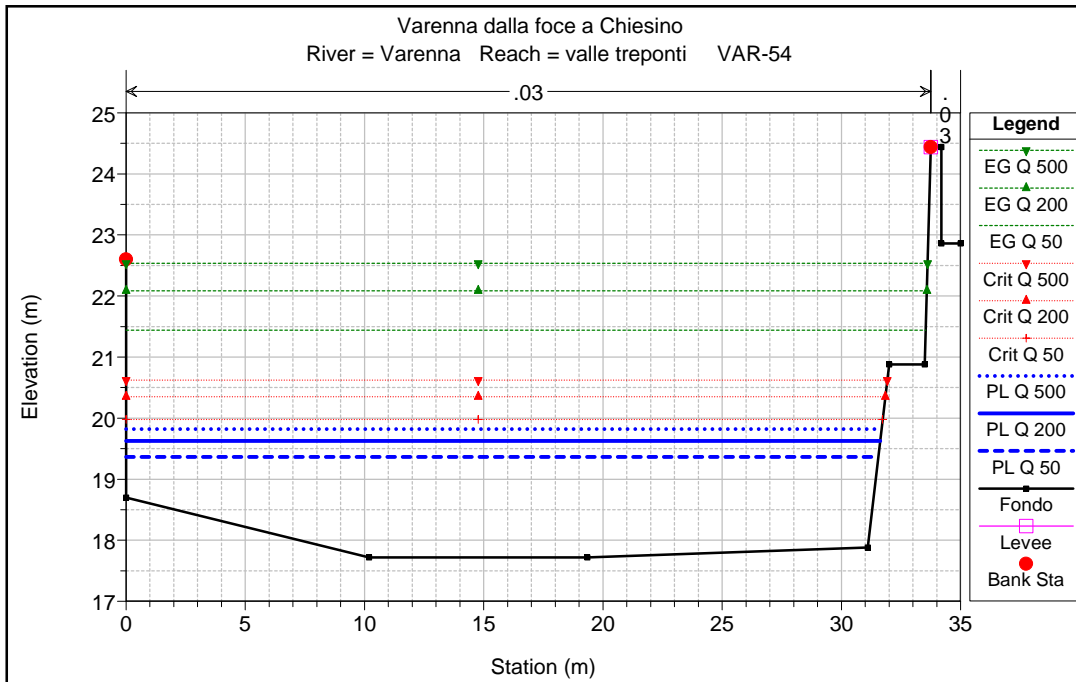


Varenna dalla foce a Chiesino  
River = Varenna Reach = valle treponti VAR-56

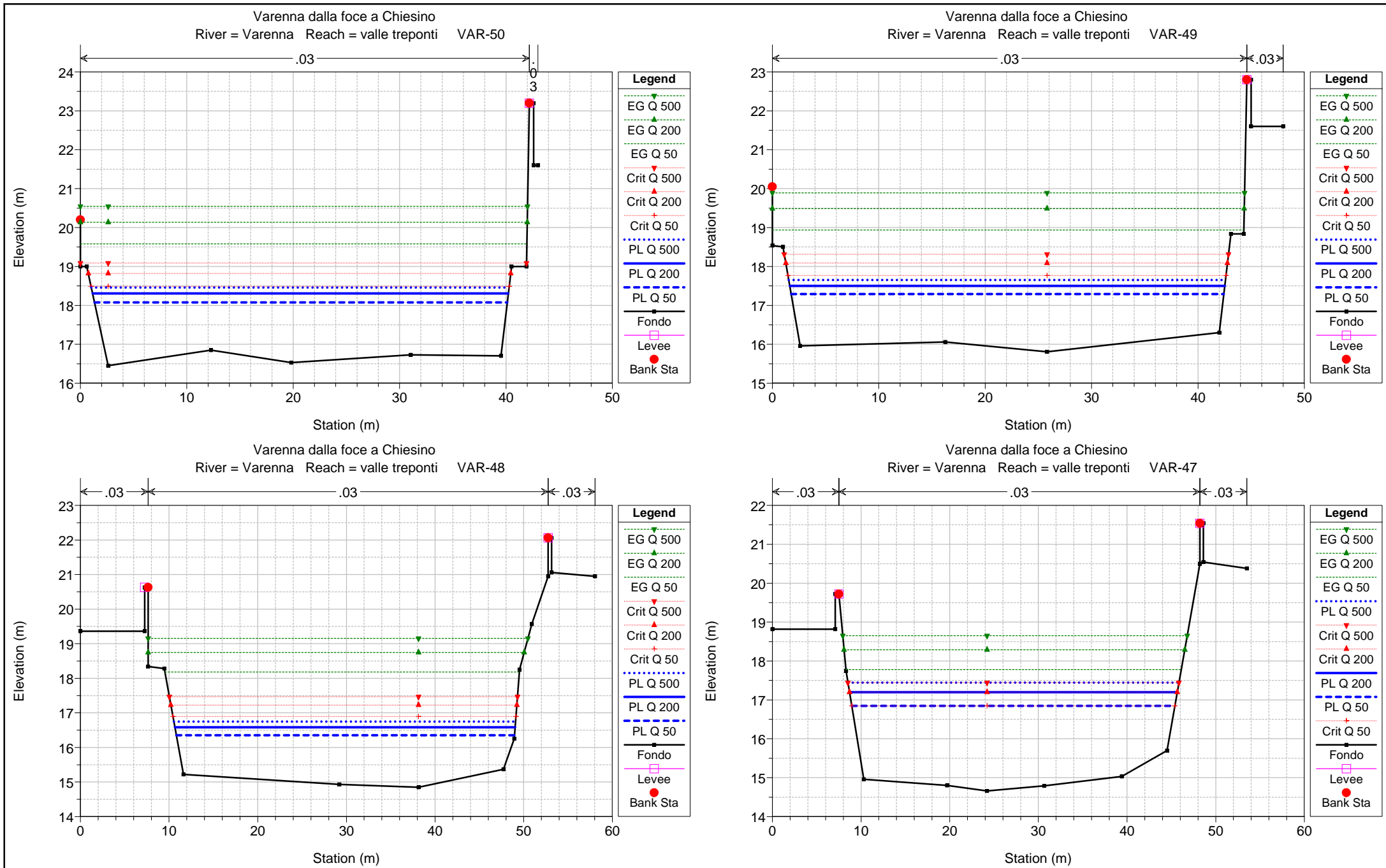


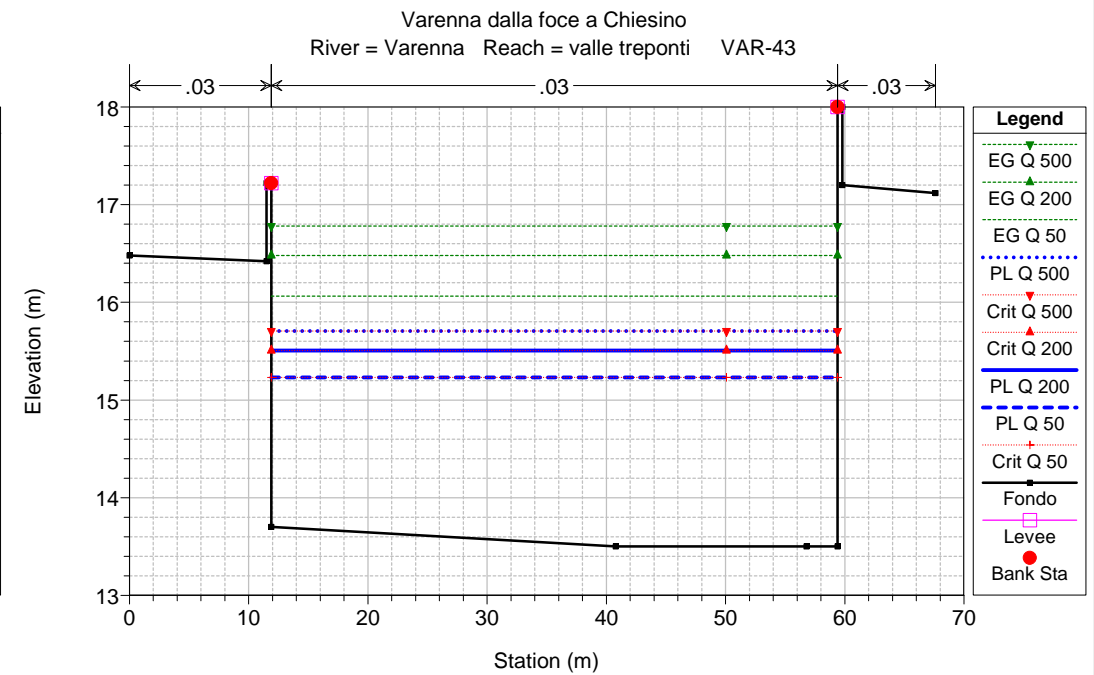
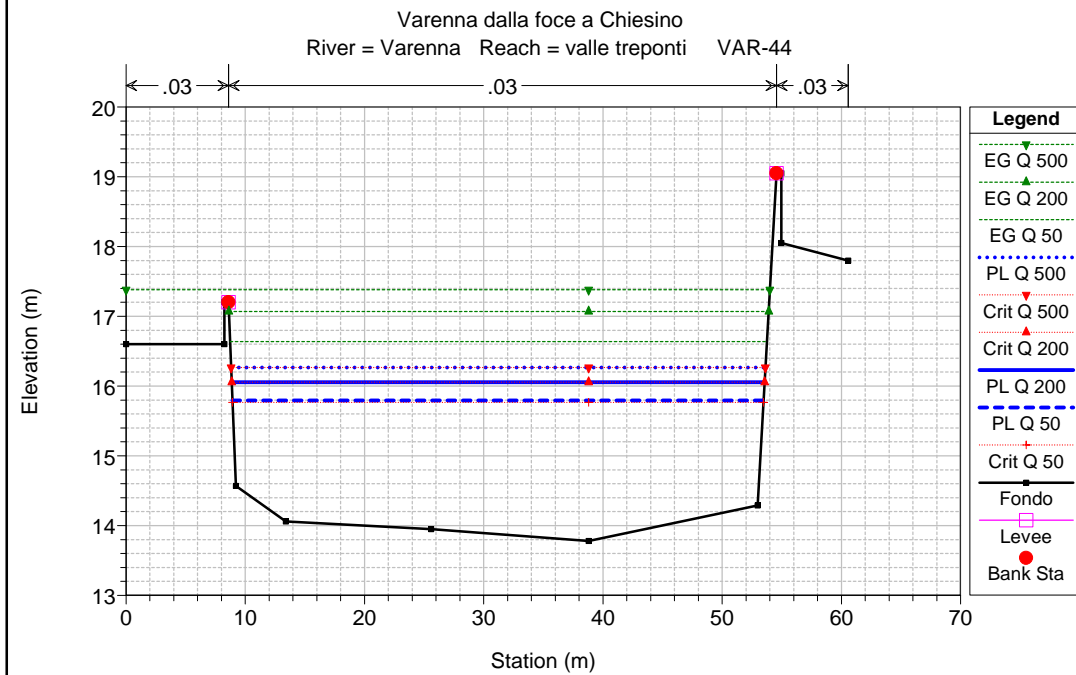
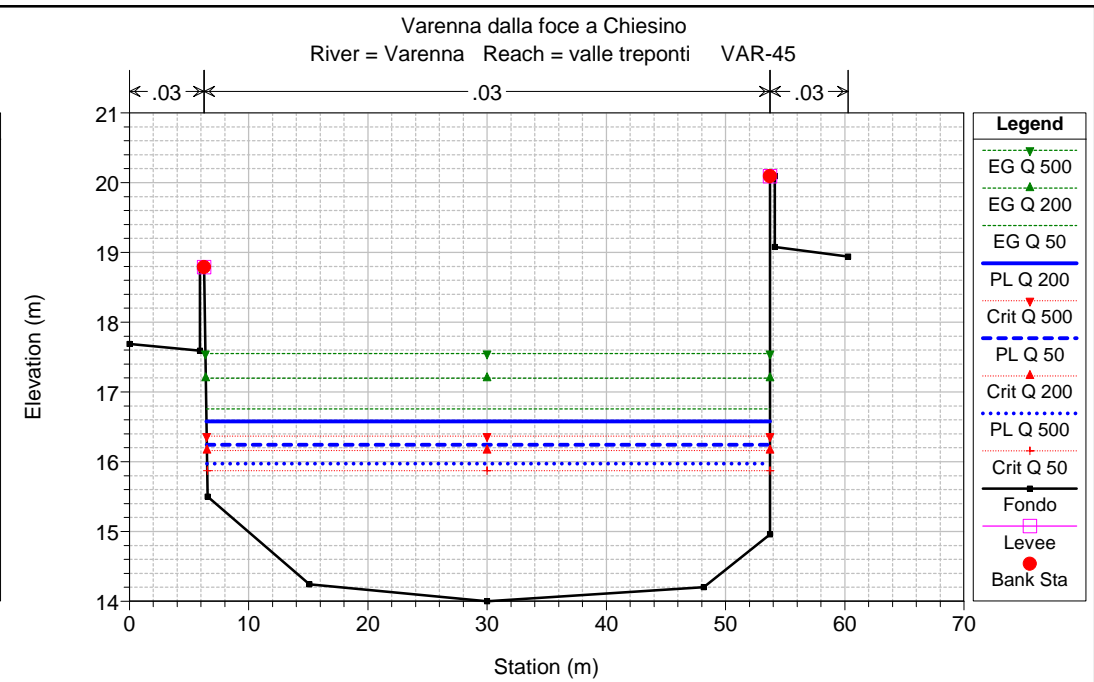
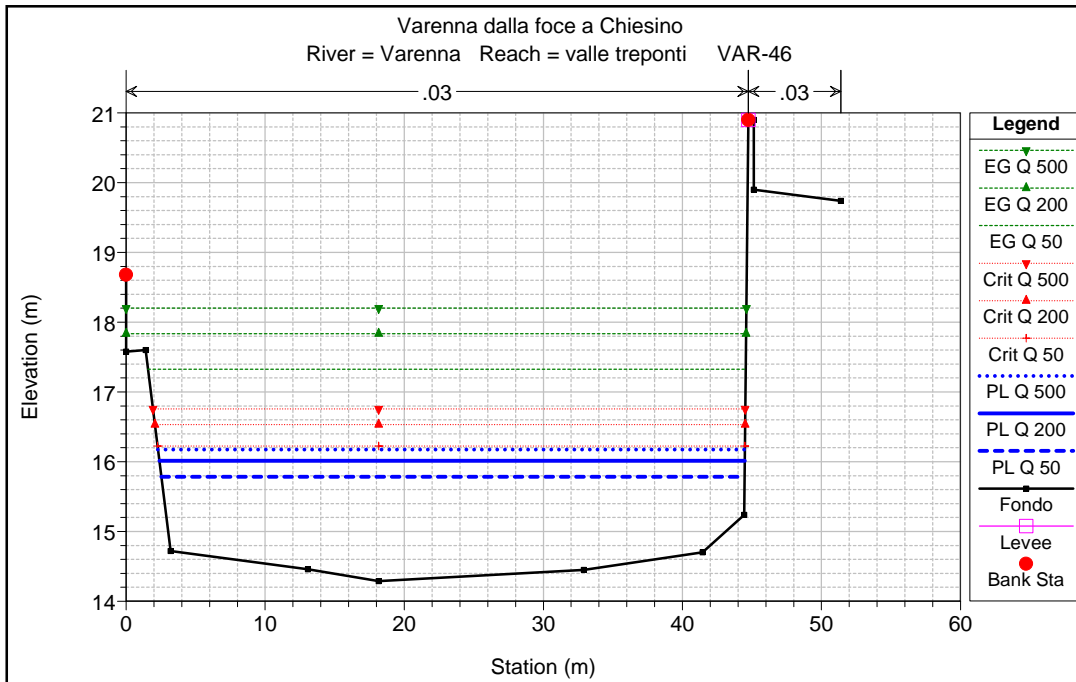
Varenna dalla foce a Chiesino  
River = Varenna Reach = valle treponti VAR-55

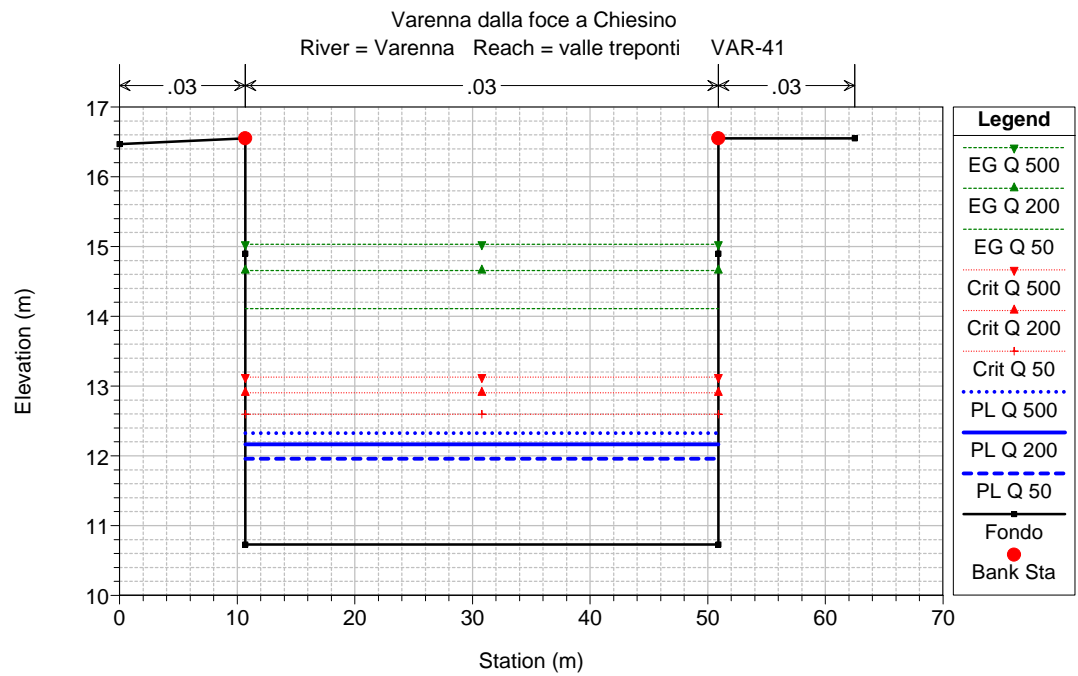
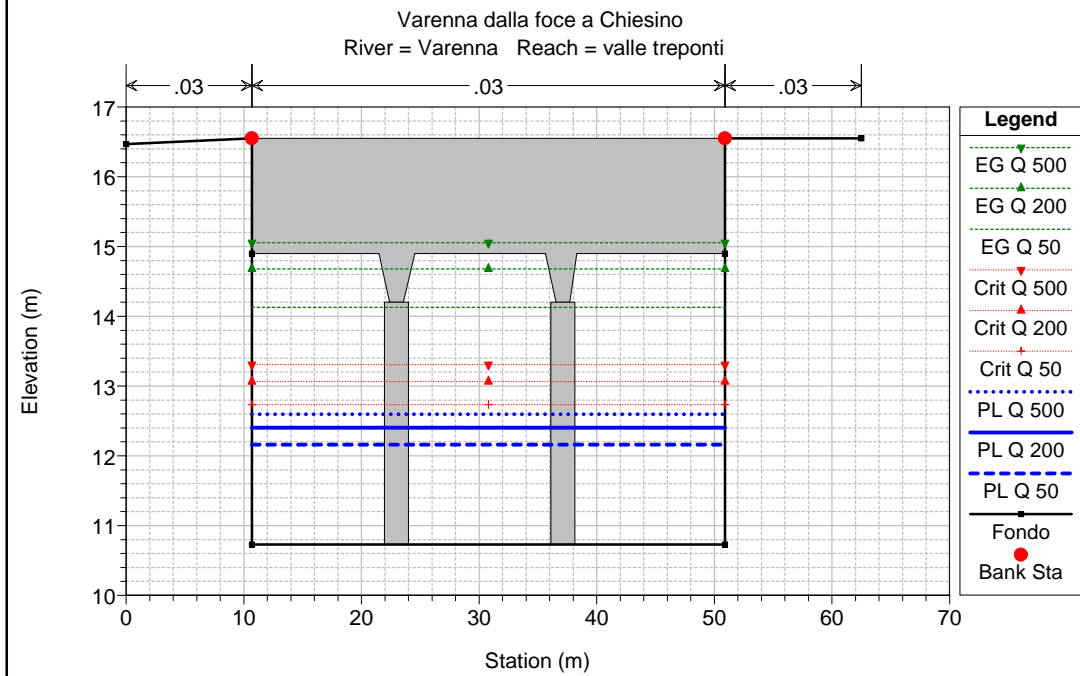
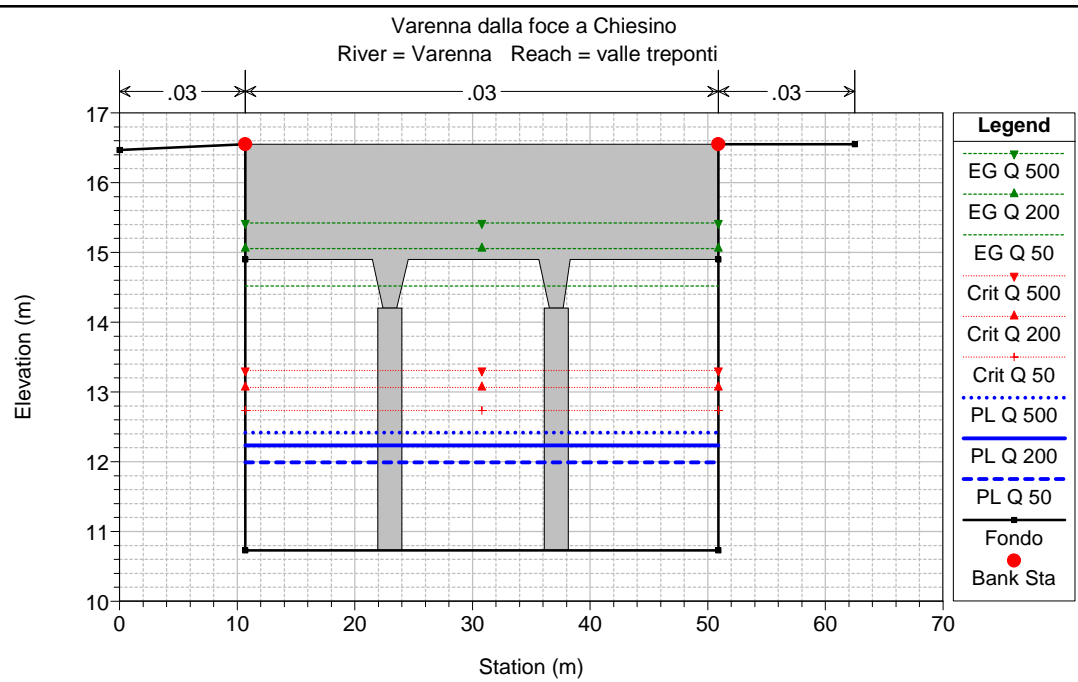
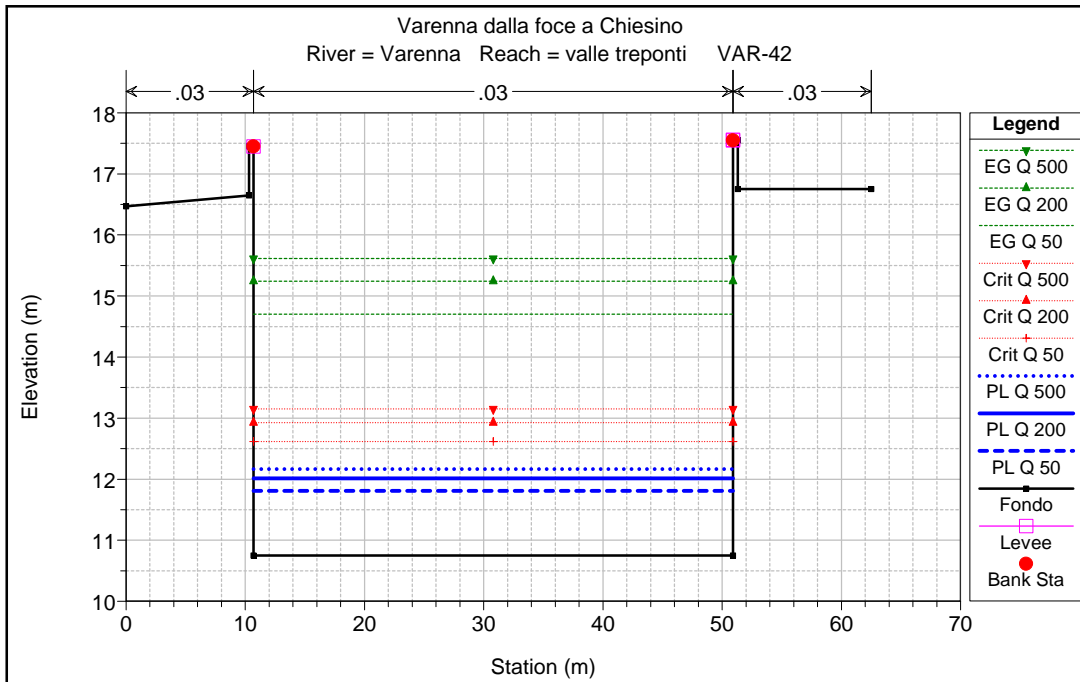


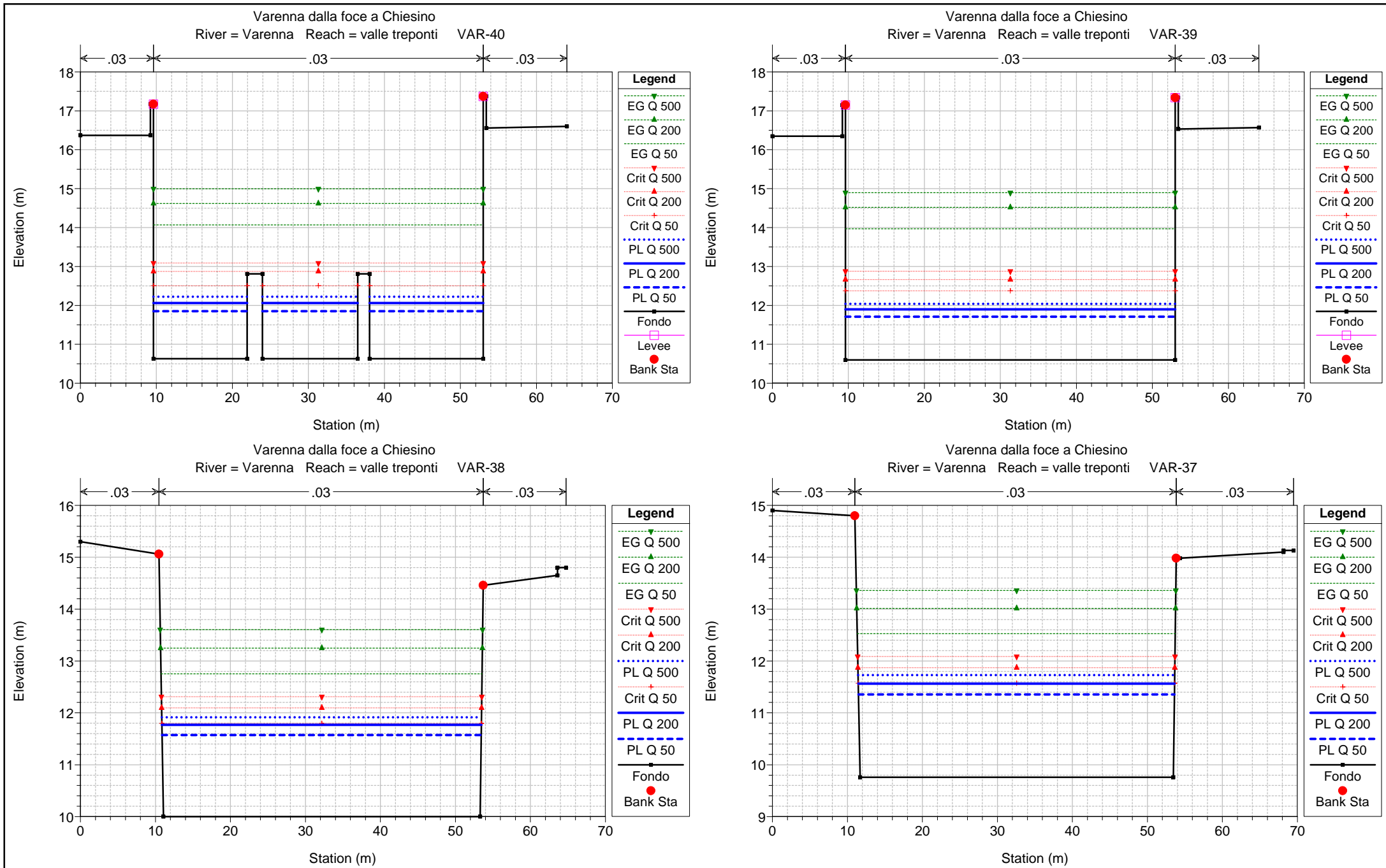


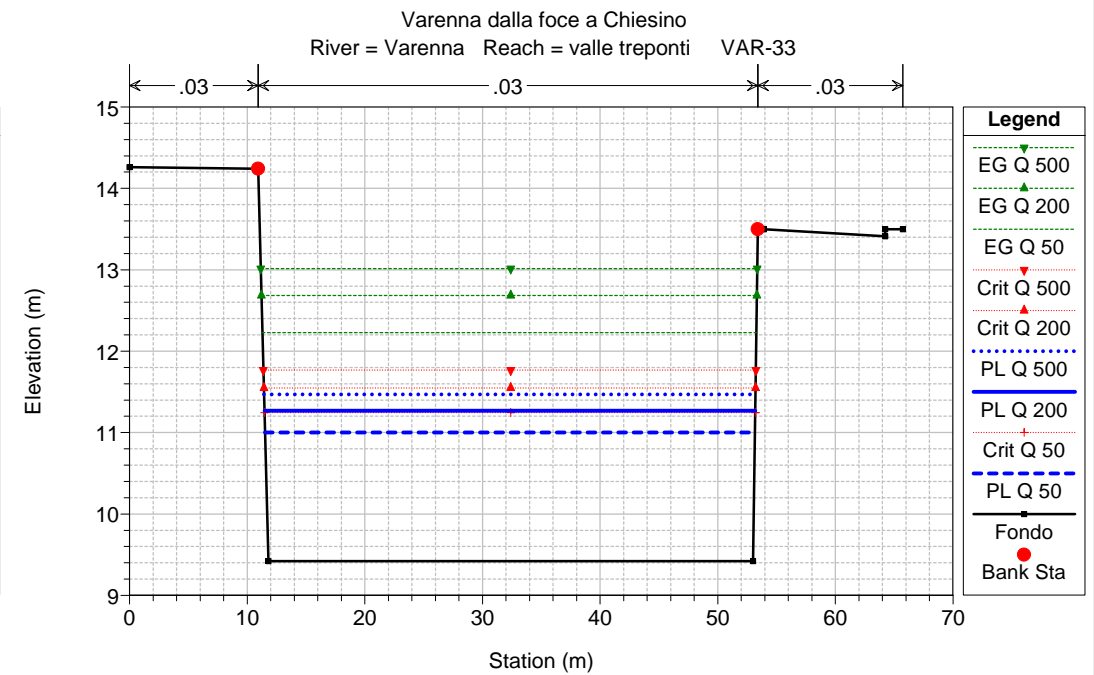
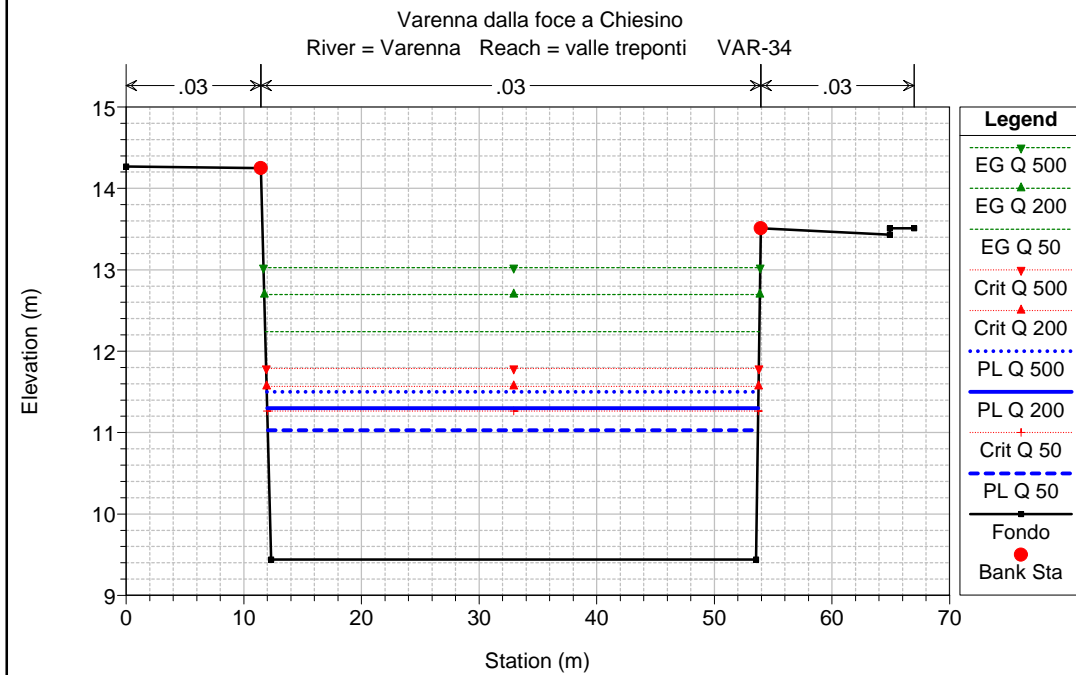
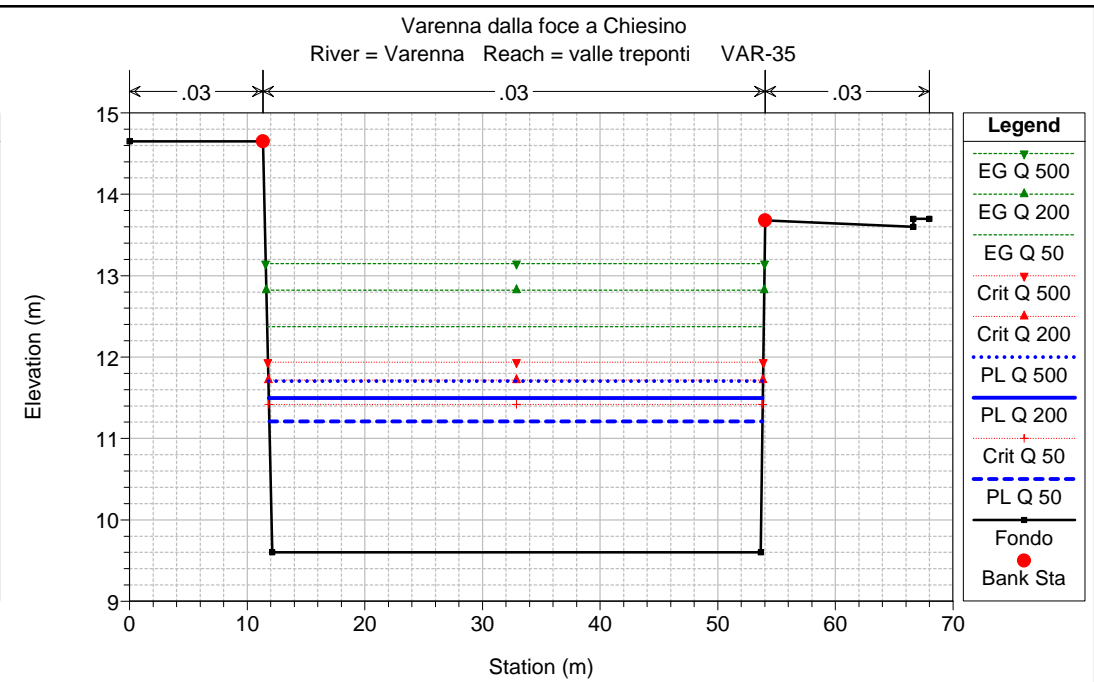
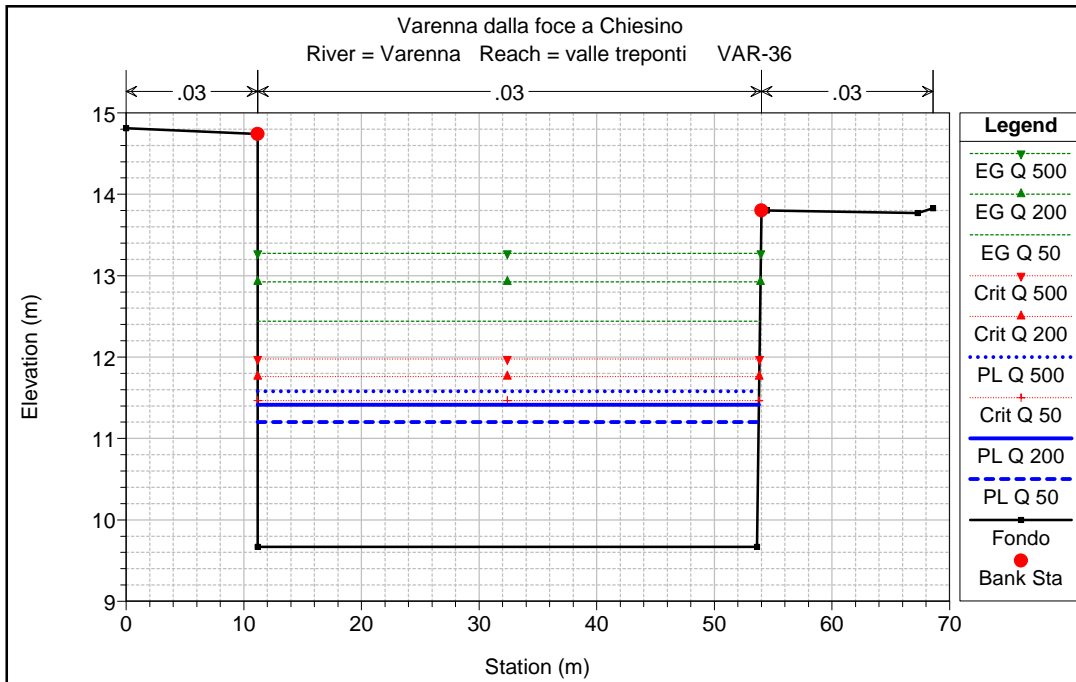


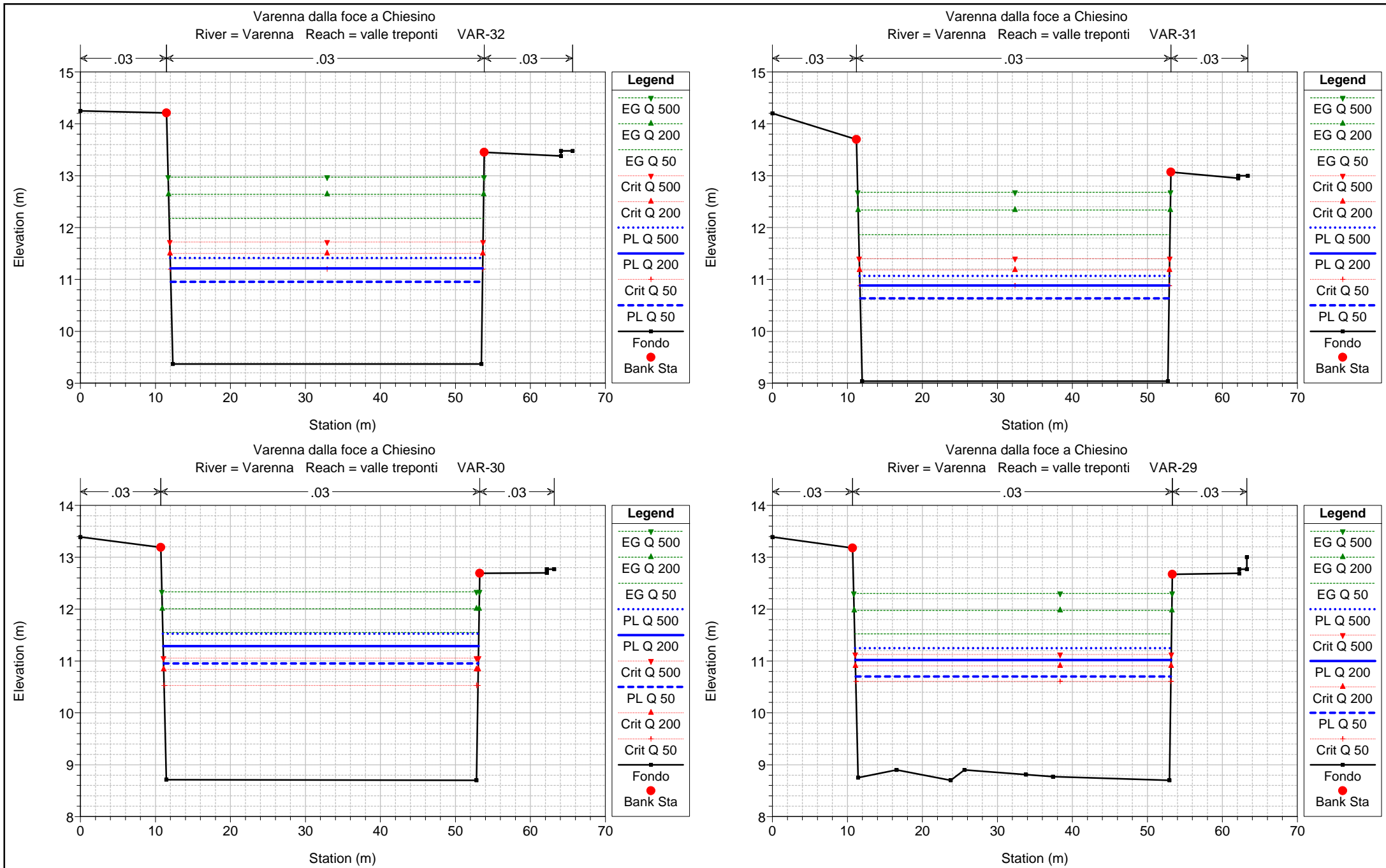


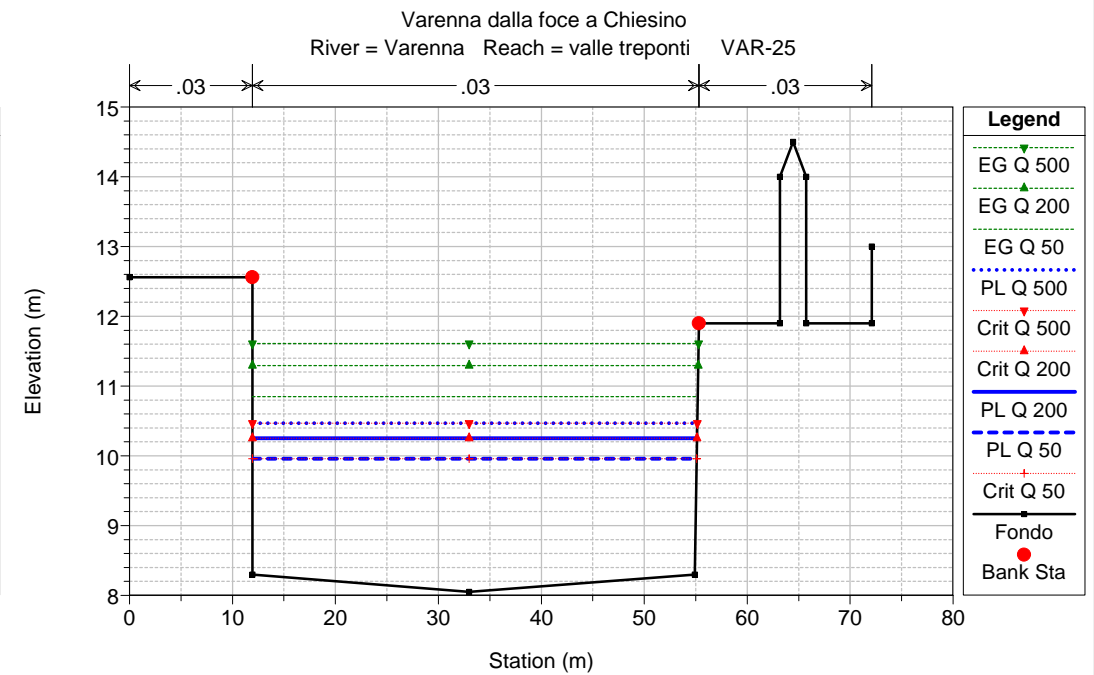
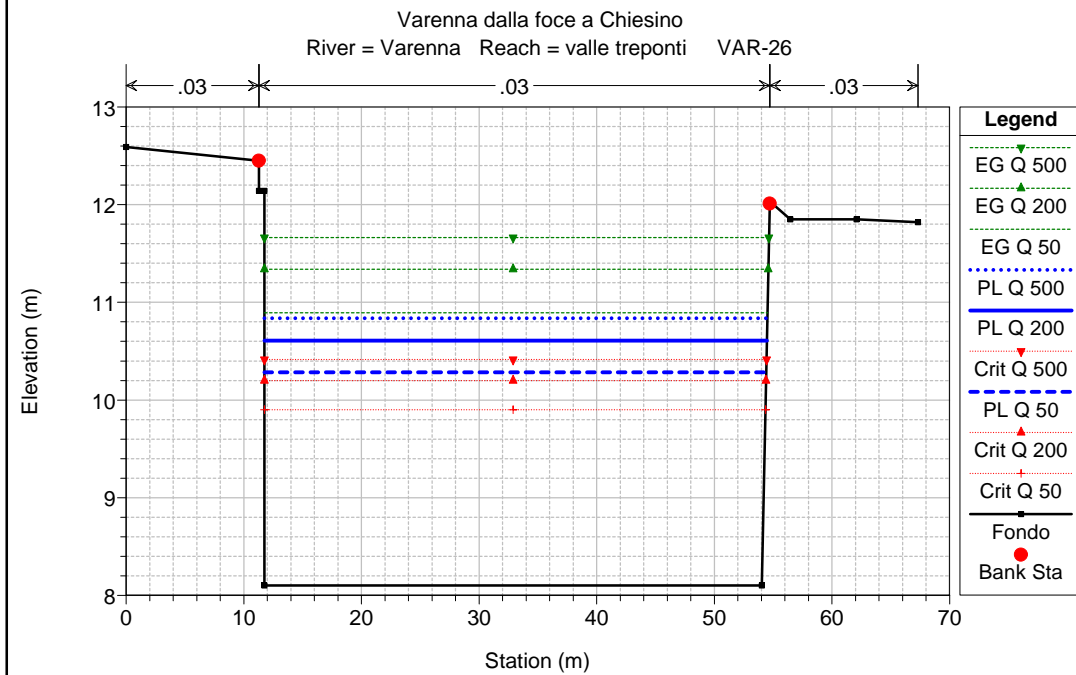
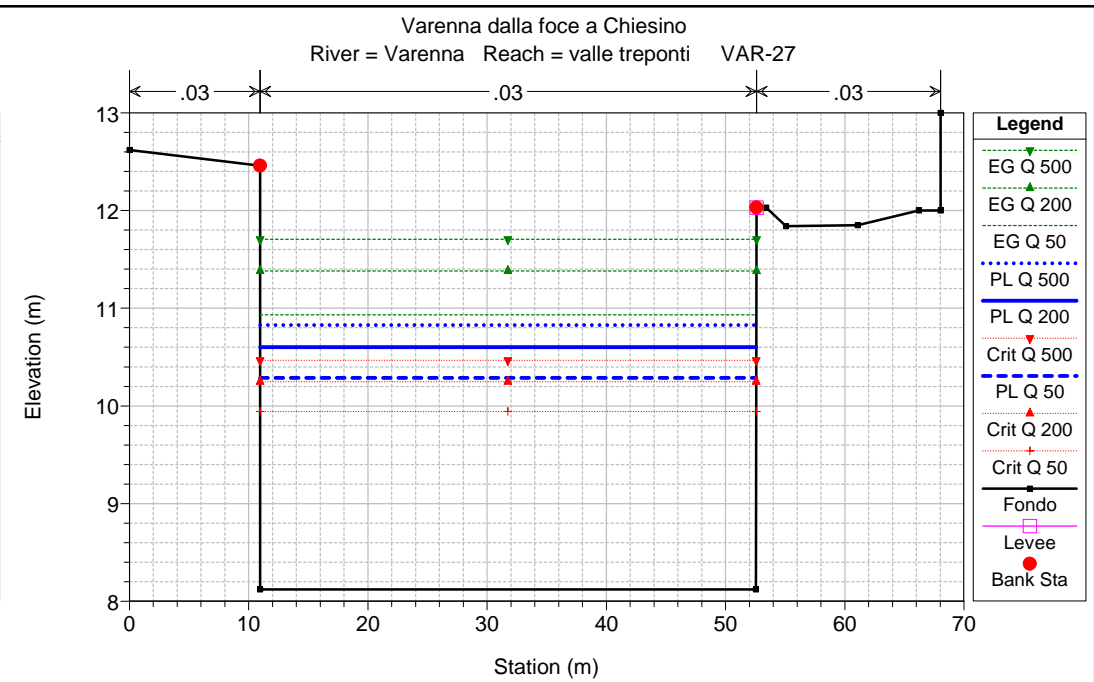
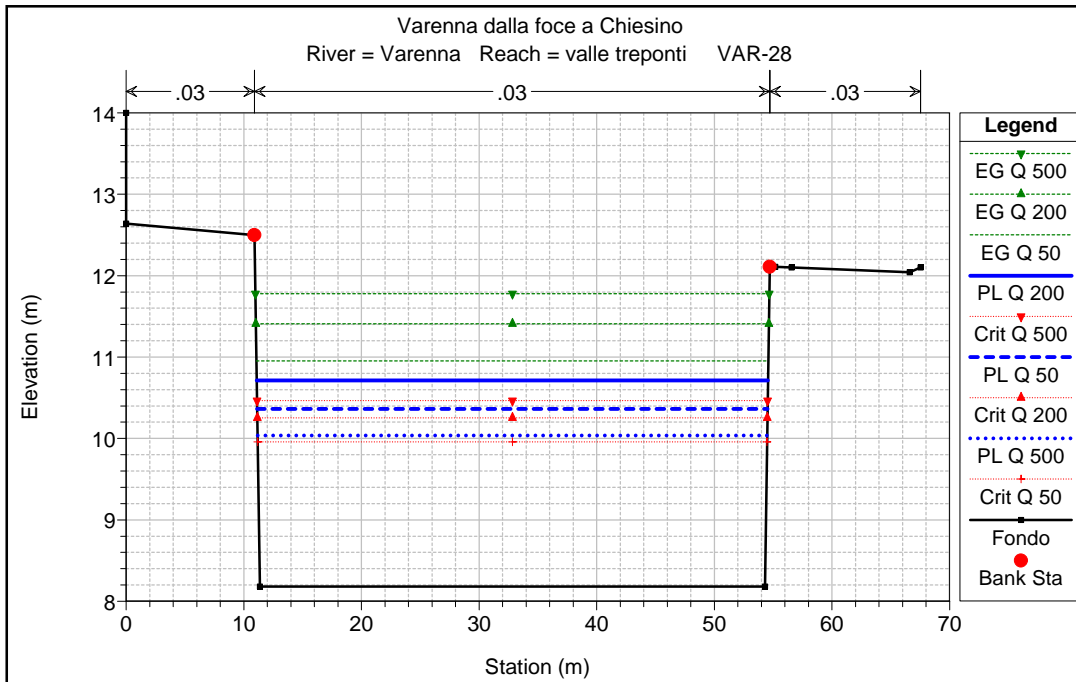


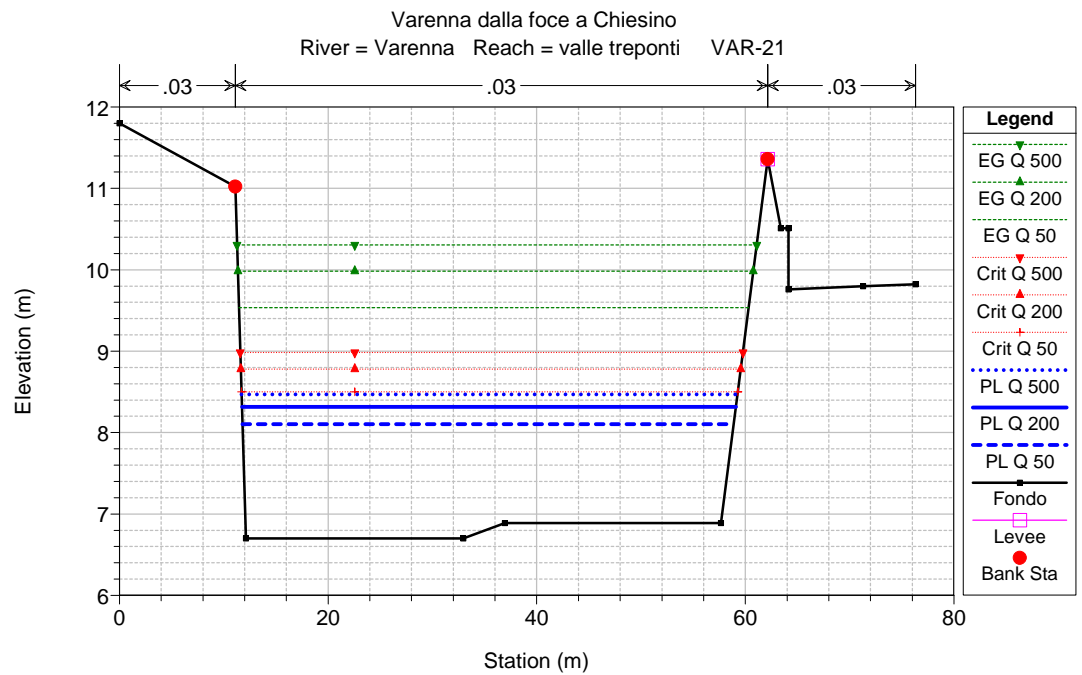
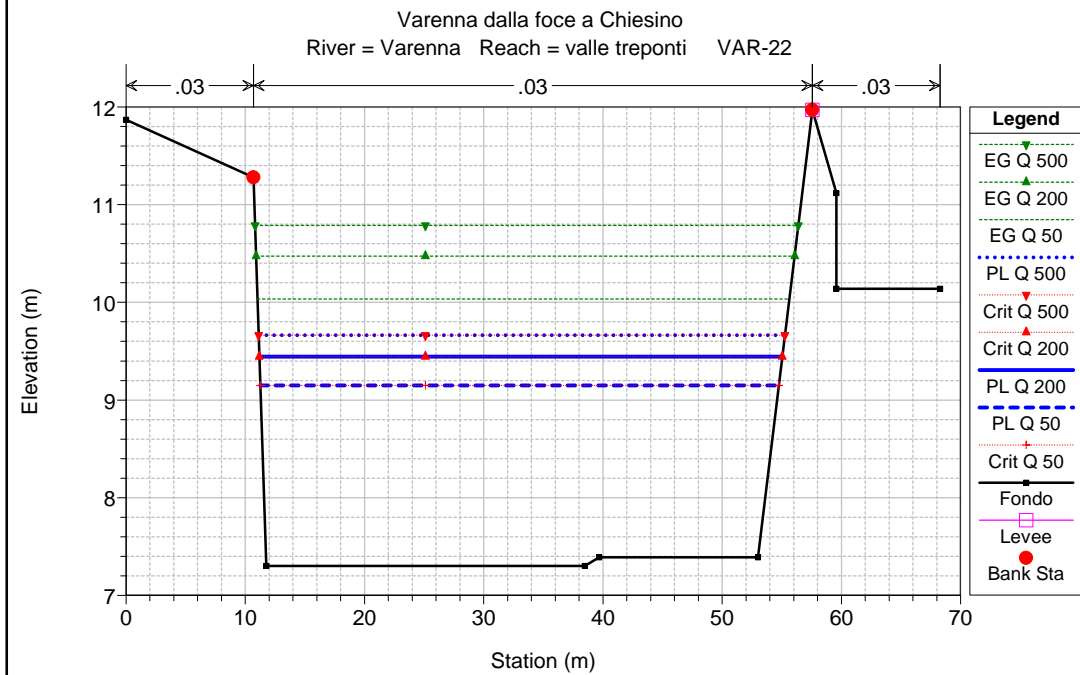
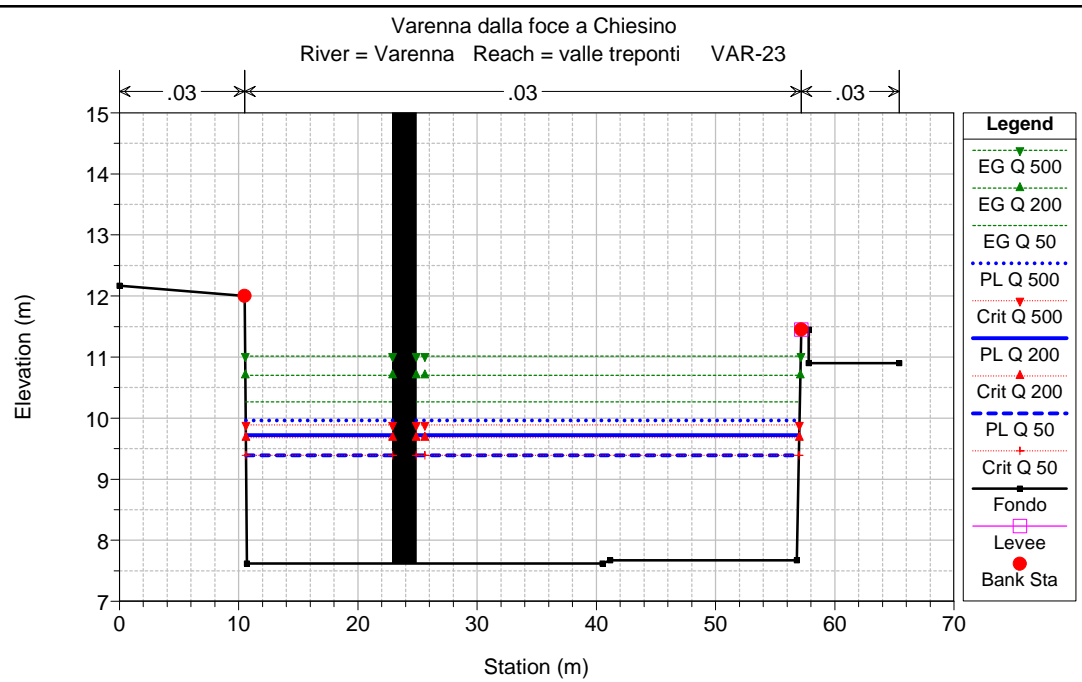
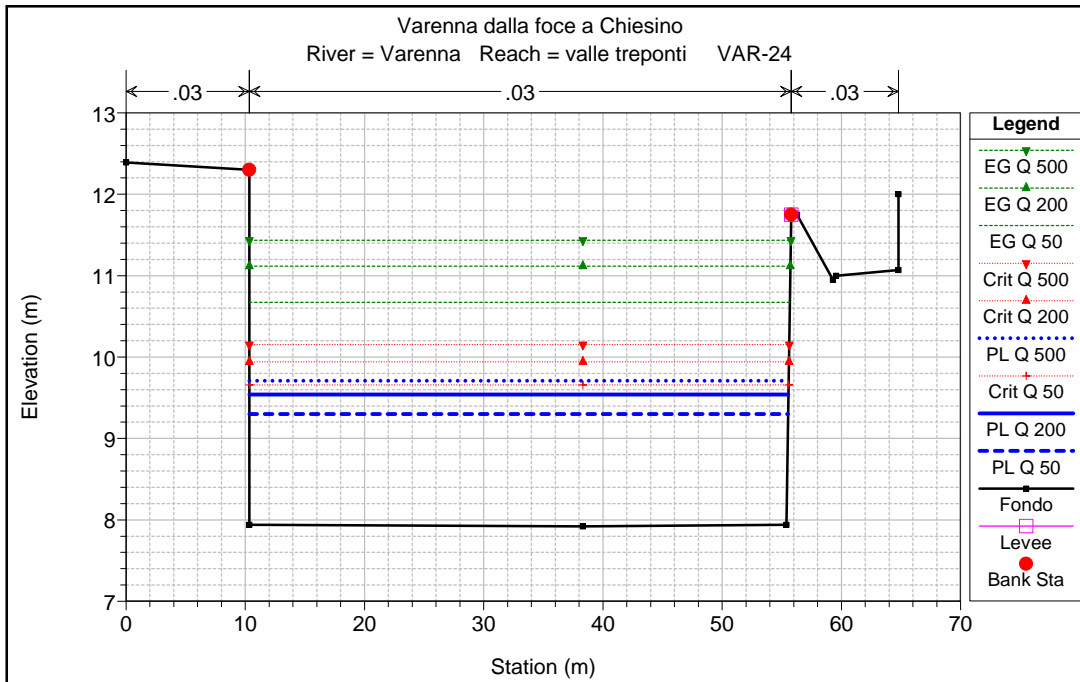




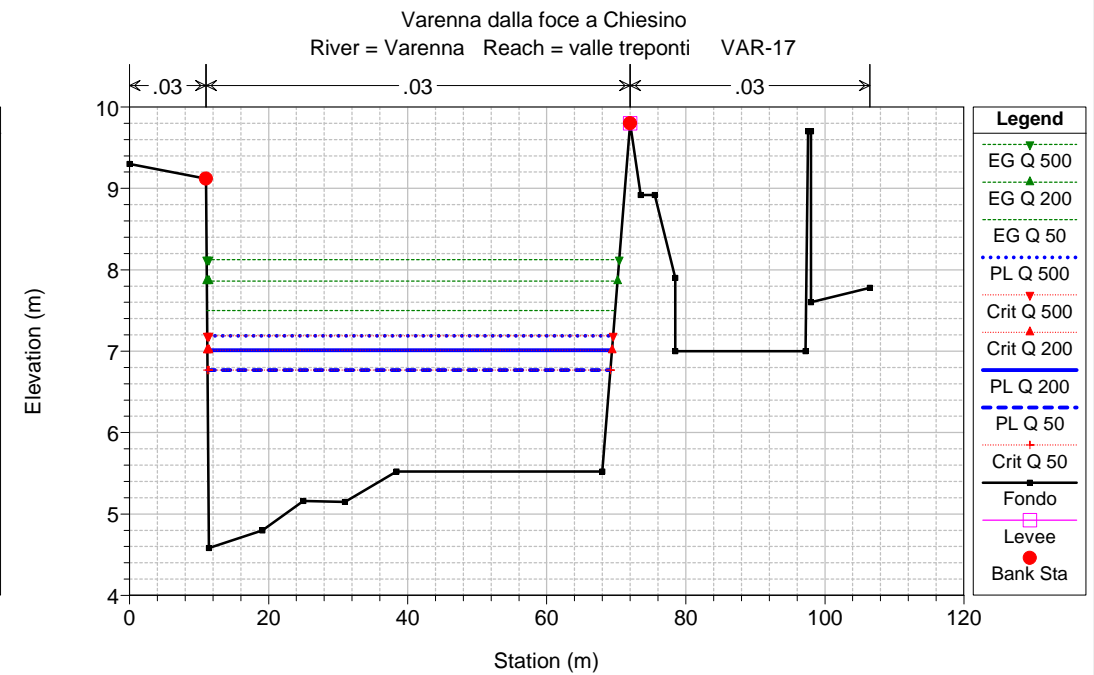
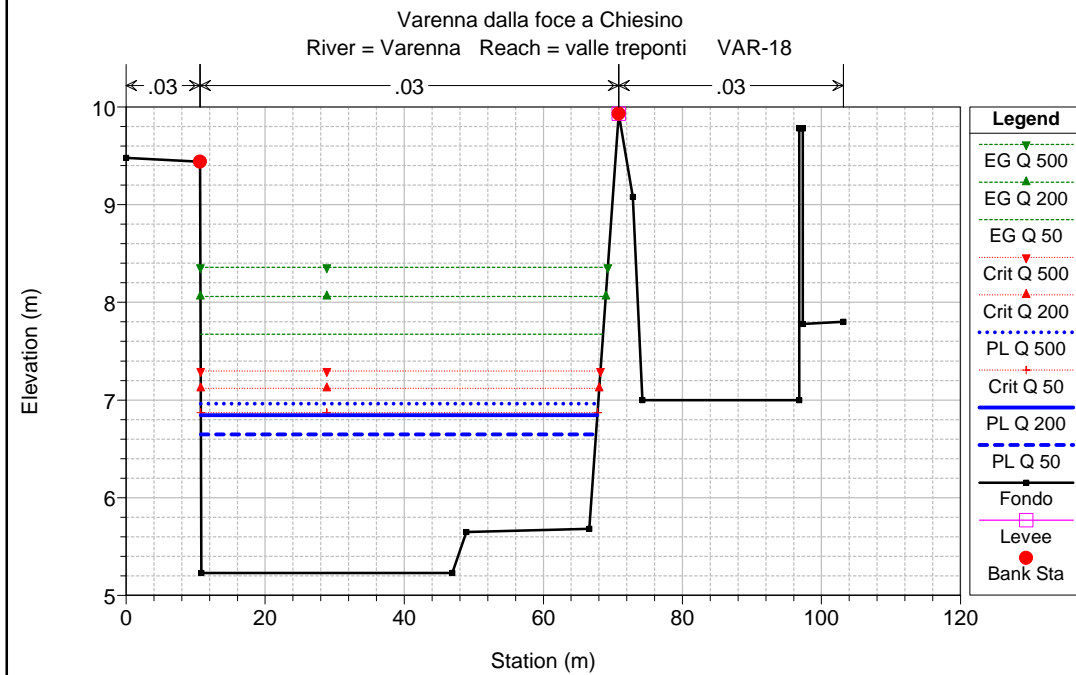
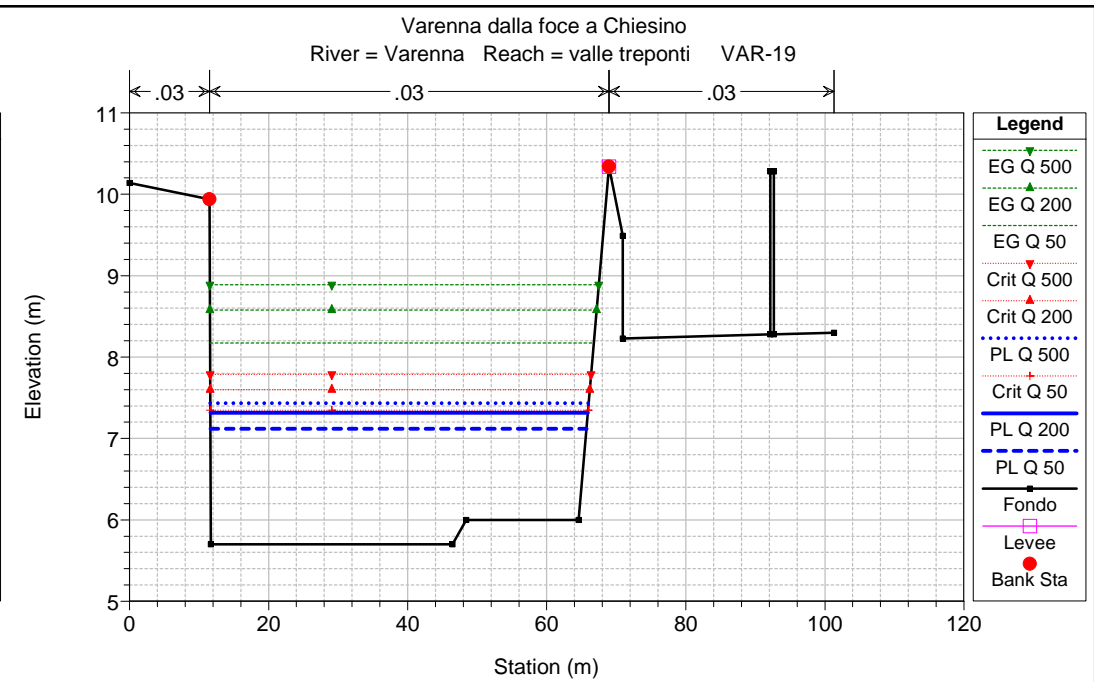
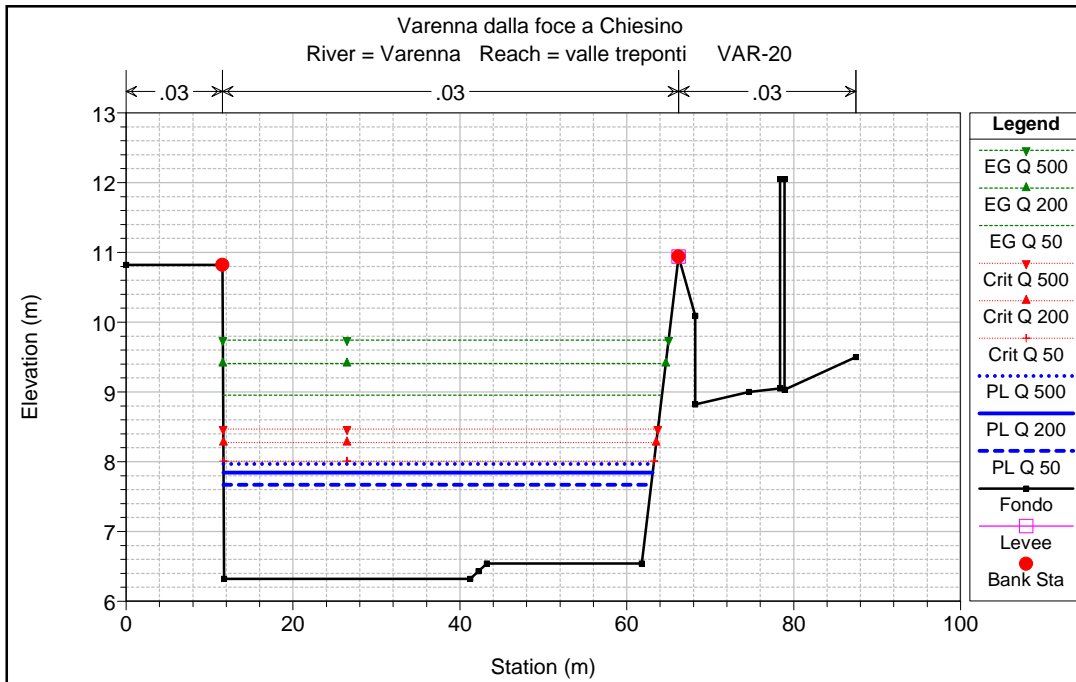


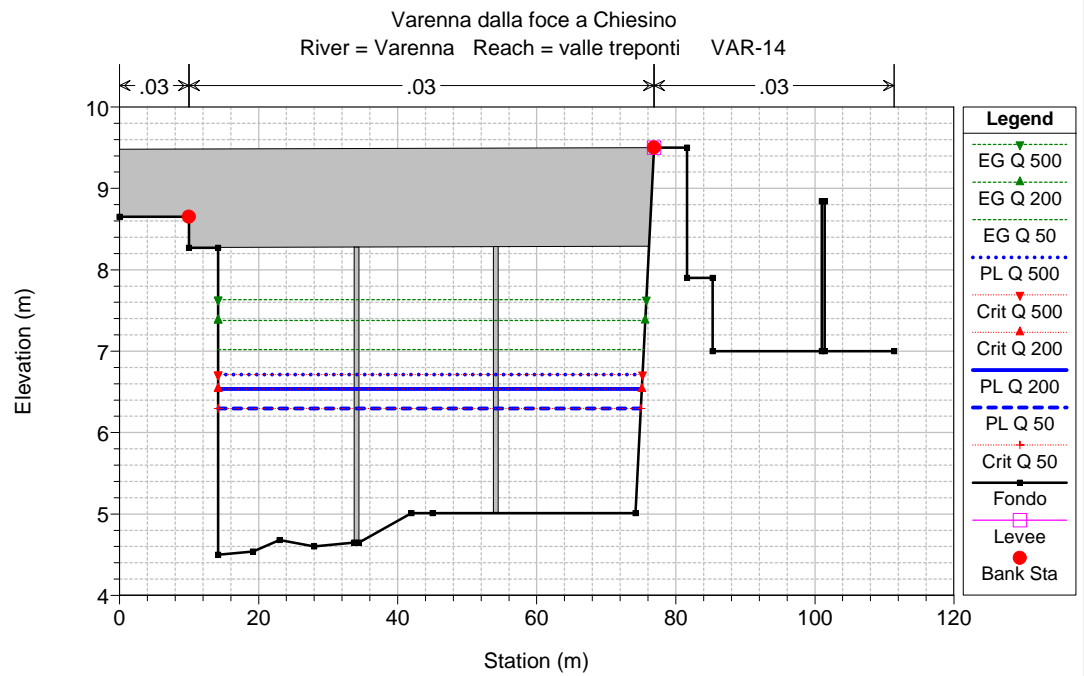
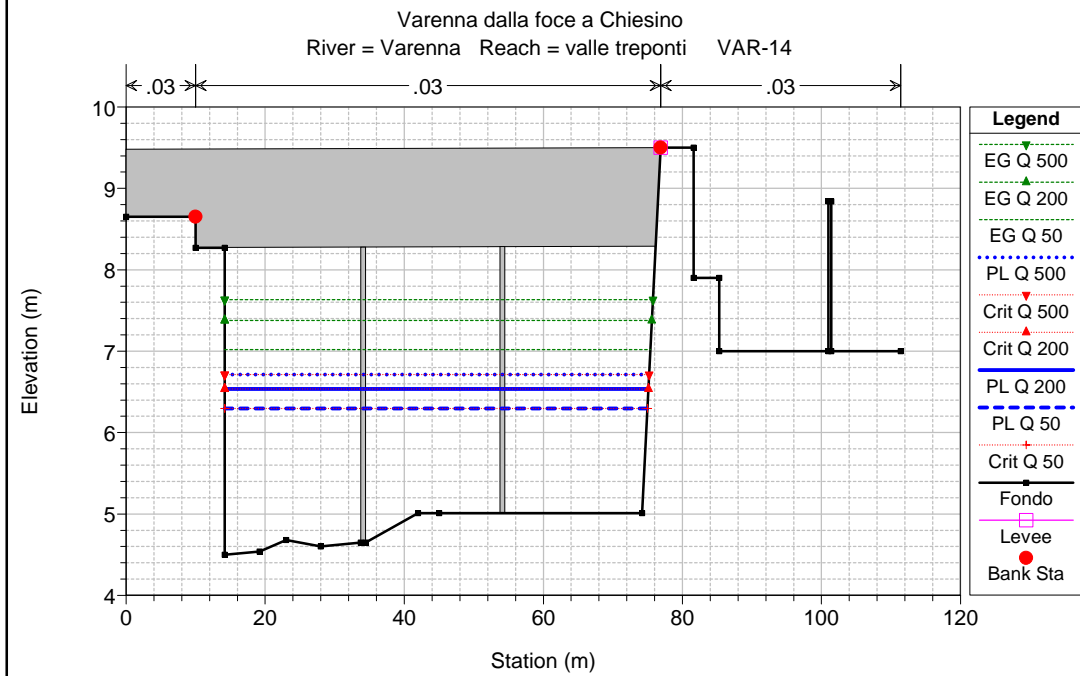
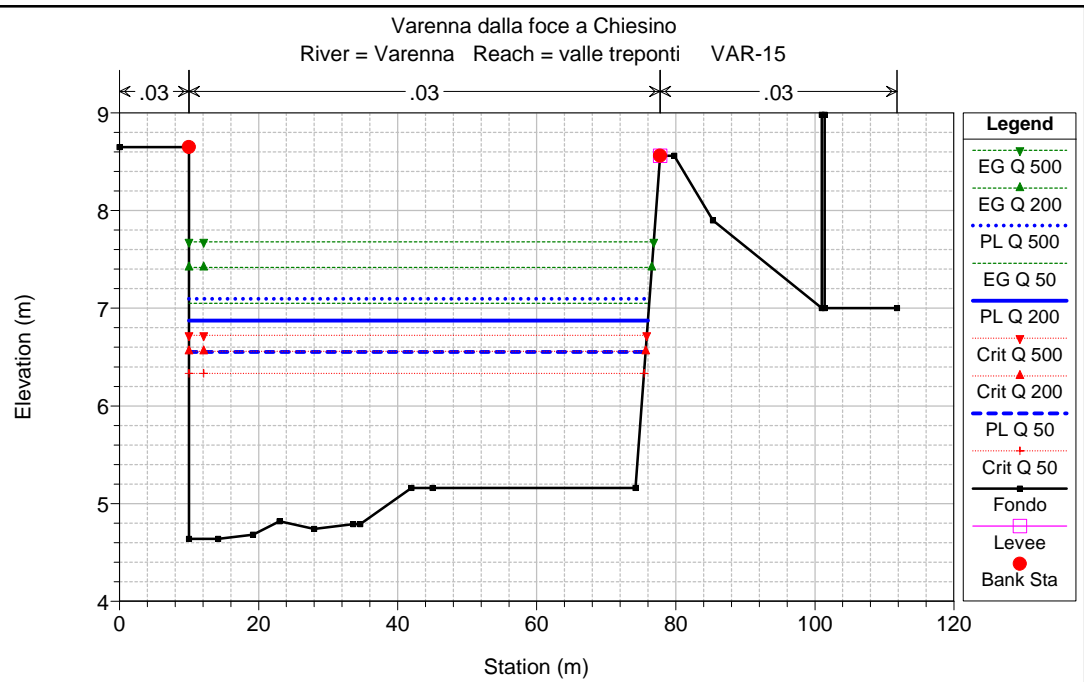
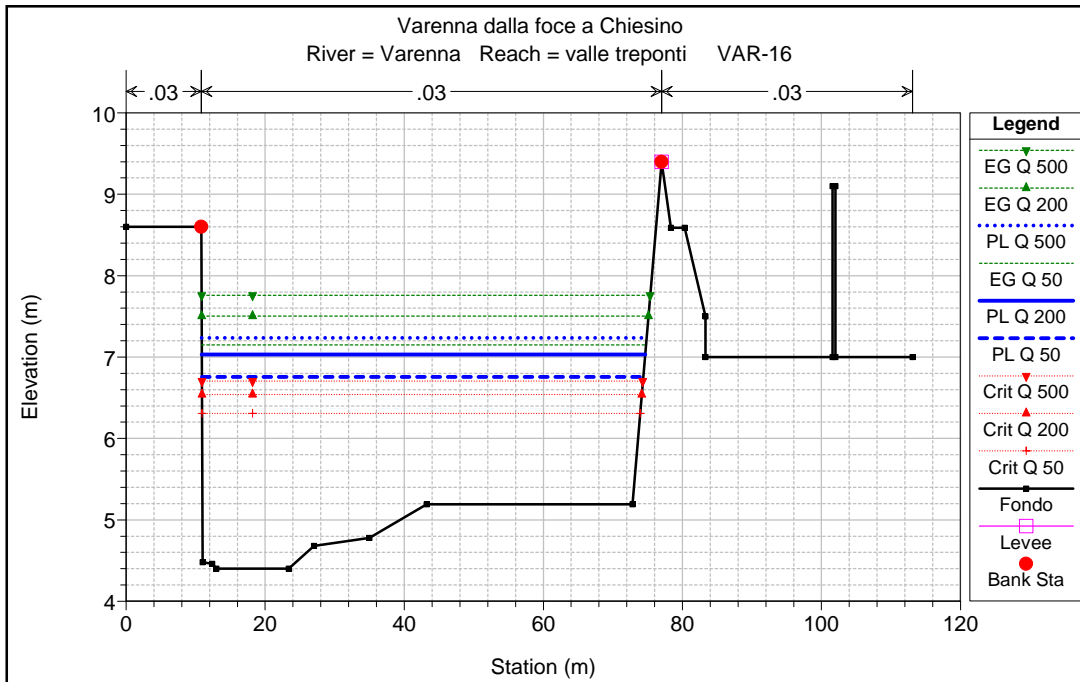


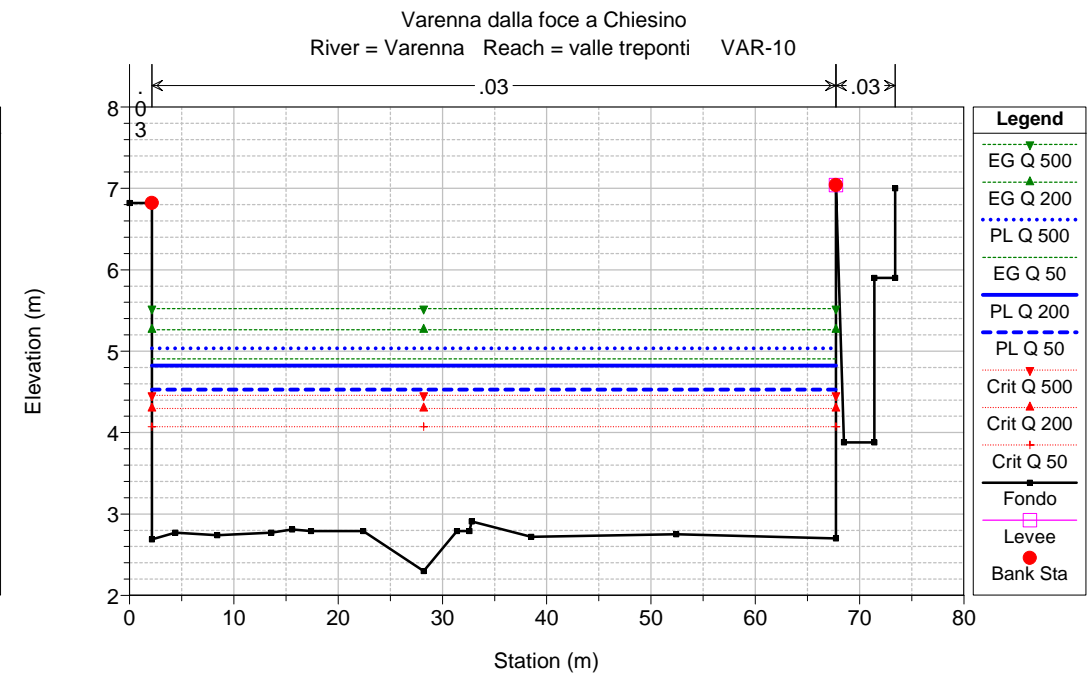
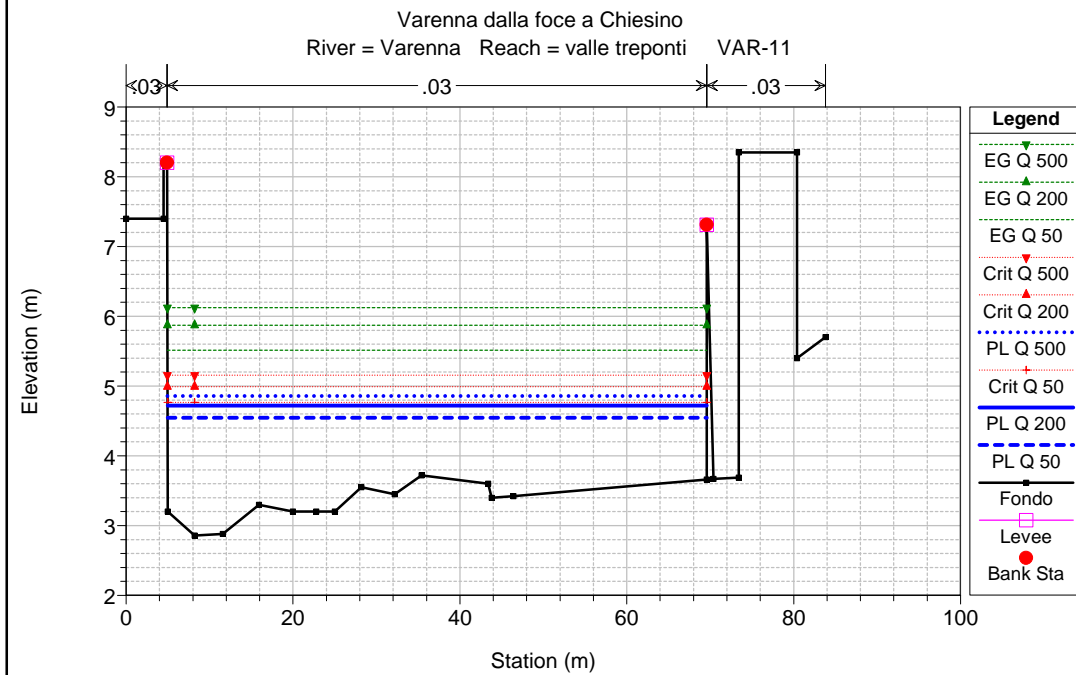
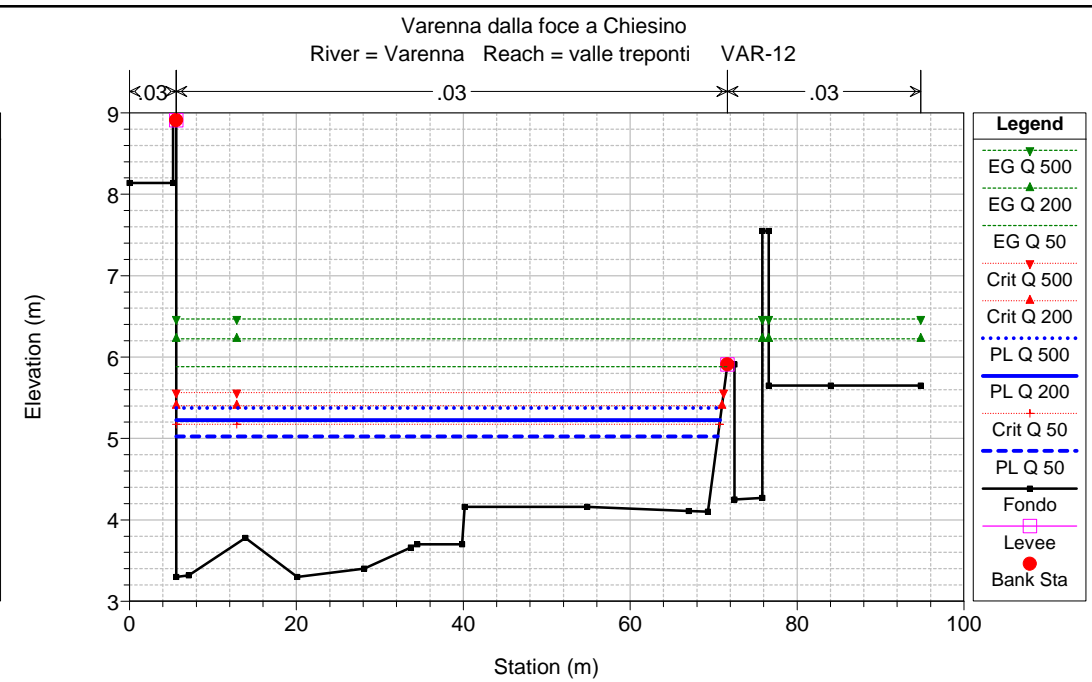
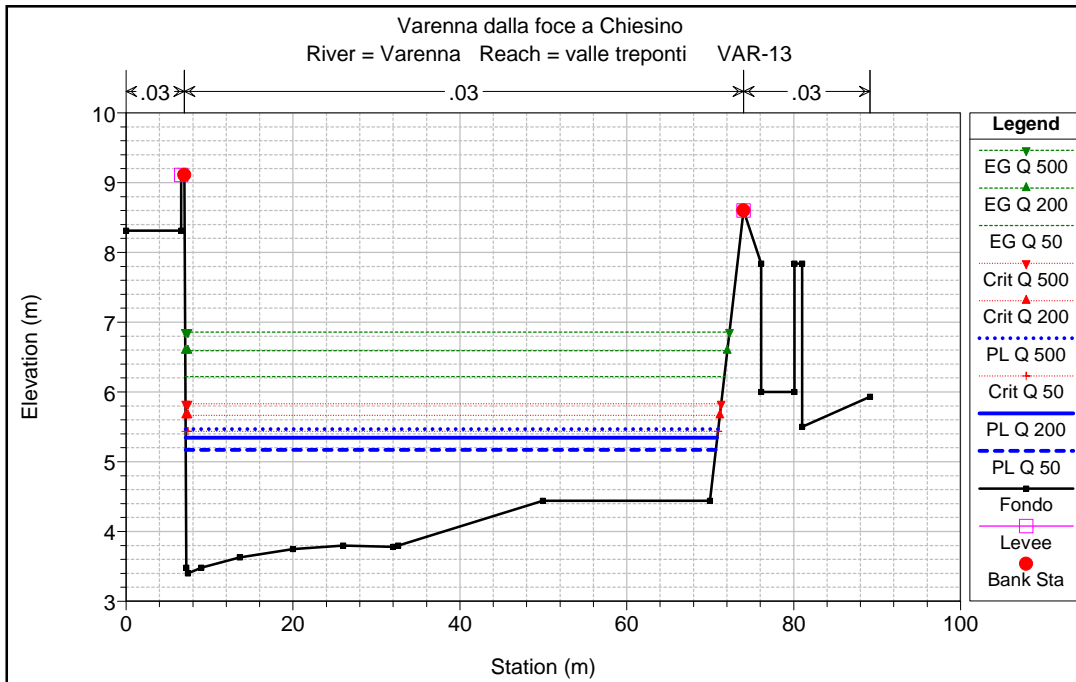




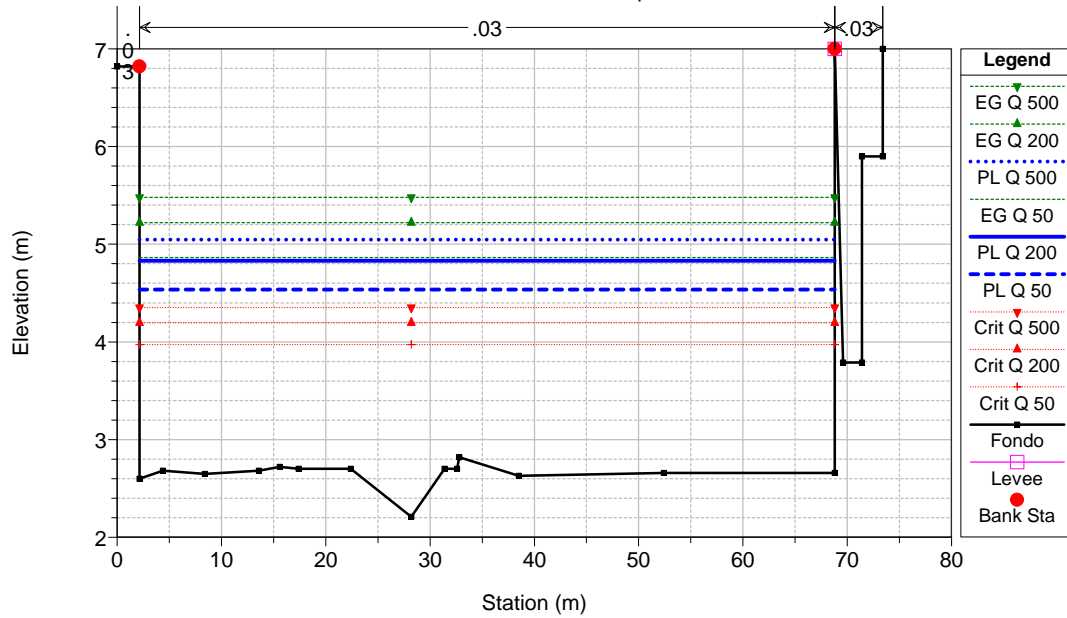




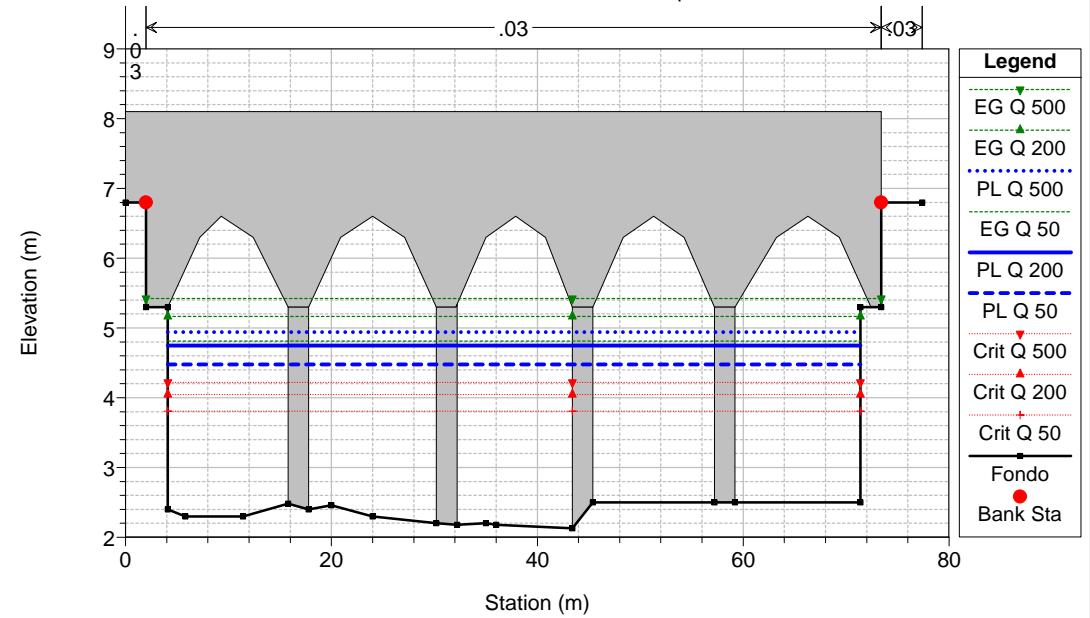




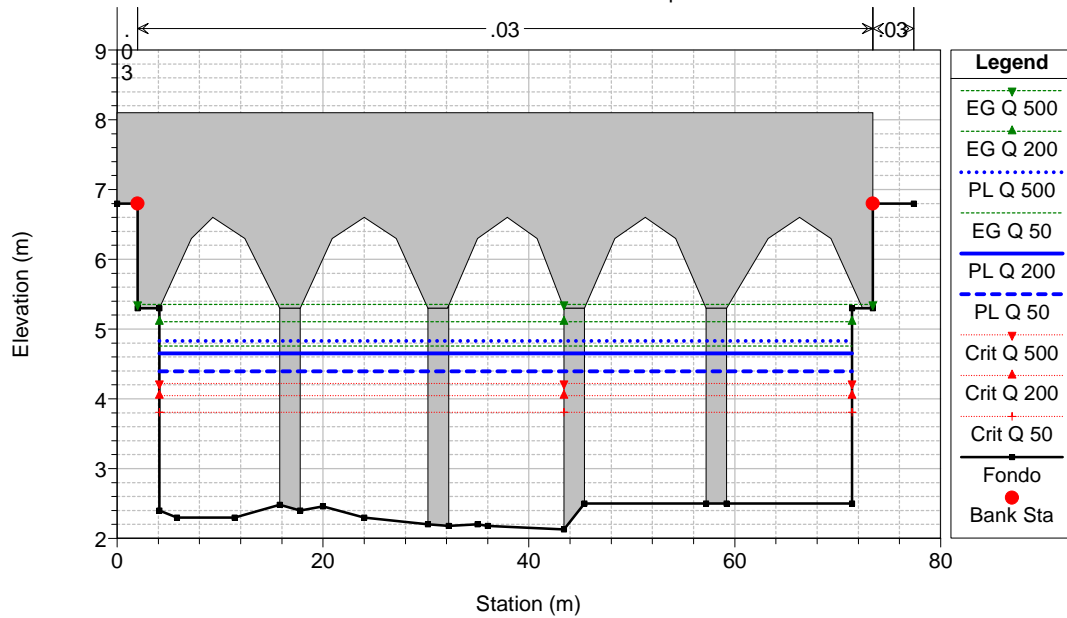
Varenna dalla foce a Chiesino  
River = Varenna Reach = valle treponti VAR-9



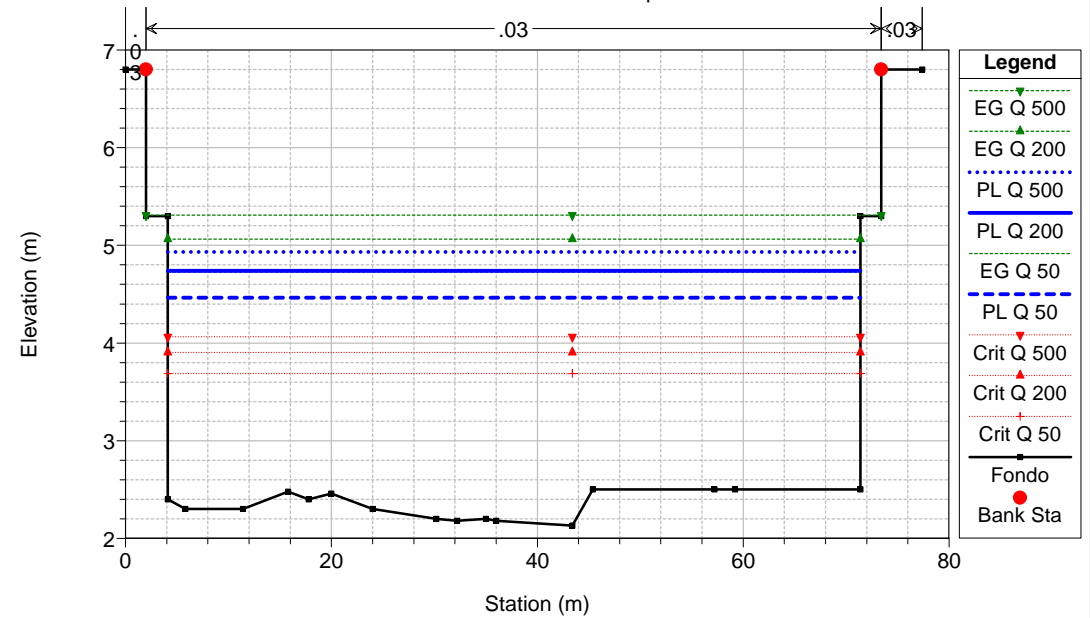
Varenna dalla foce a Chiesino  
River = Varenna Reach = valle treponti

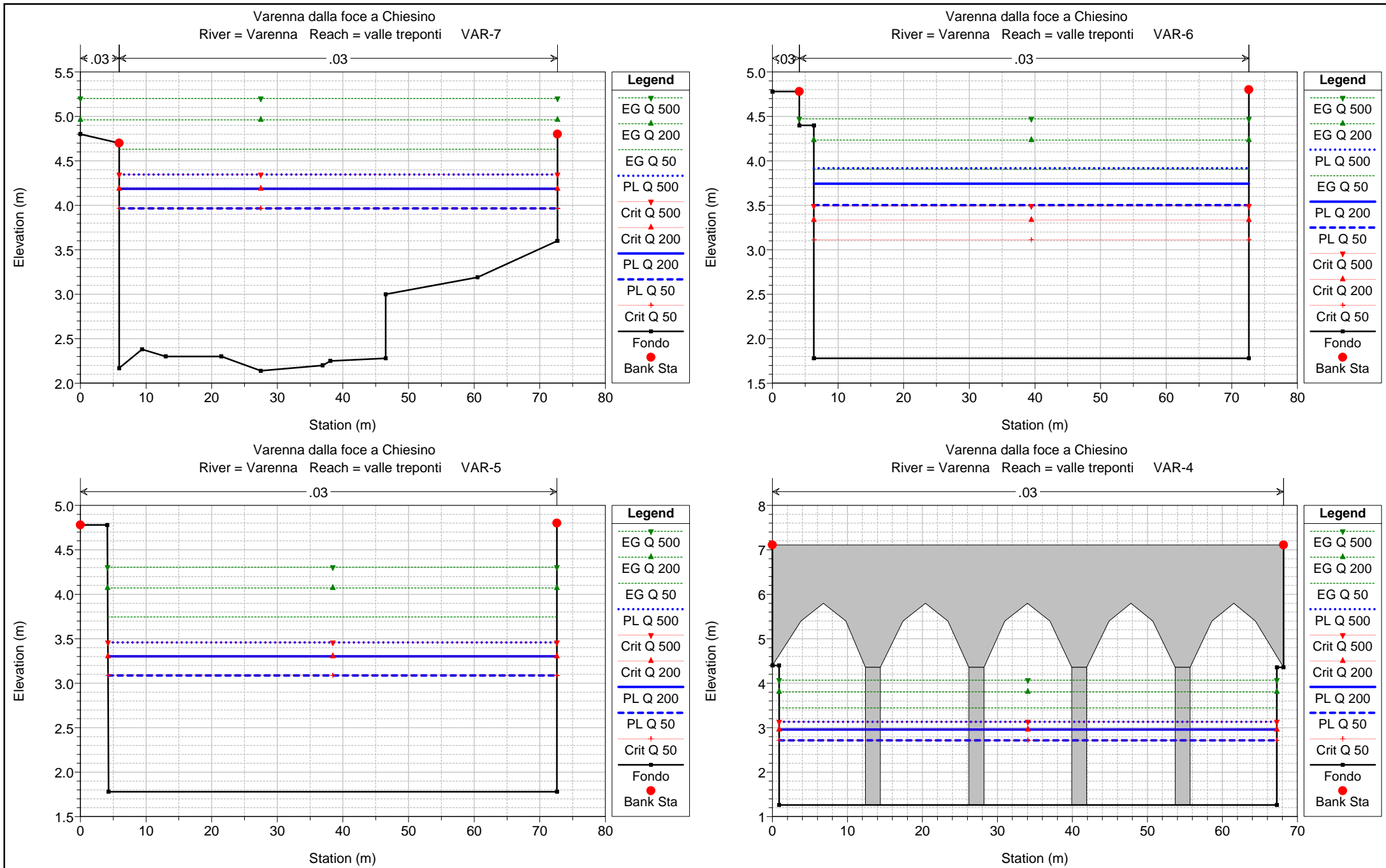


Varenna dalla foce a Chiesino  
River = Varenna Reach = valle treponti

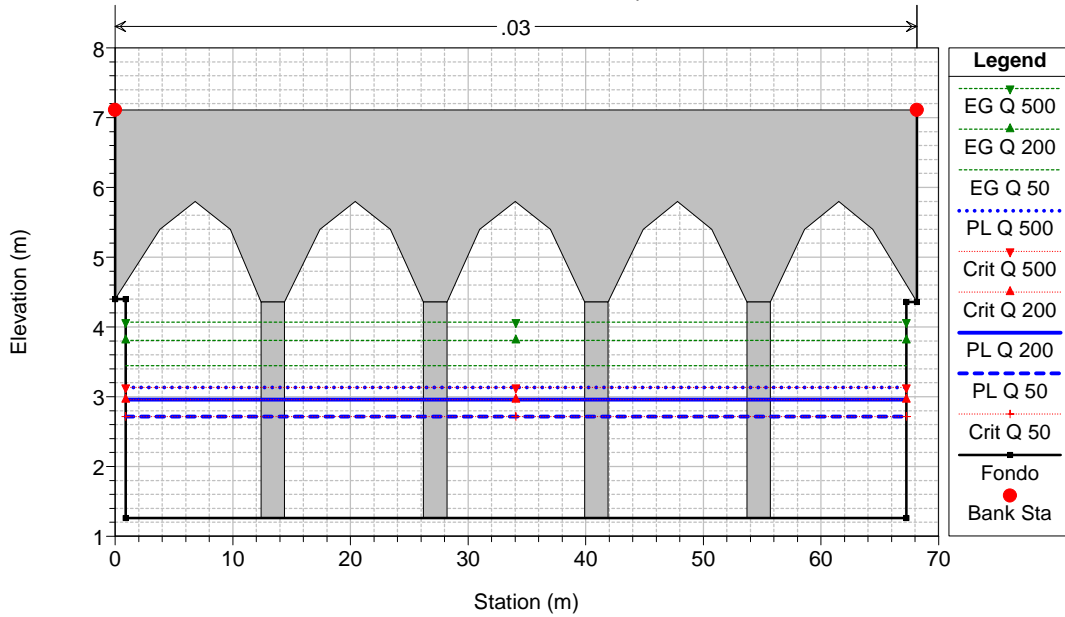


Varenna dalla foce a Chiesino  
River = Varenna Reach = valle treponti VAR-8

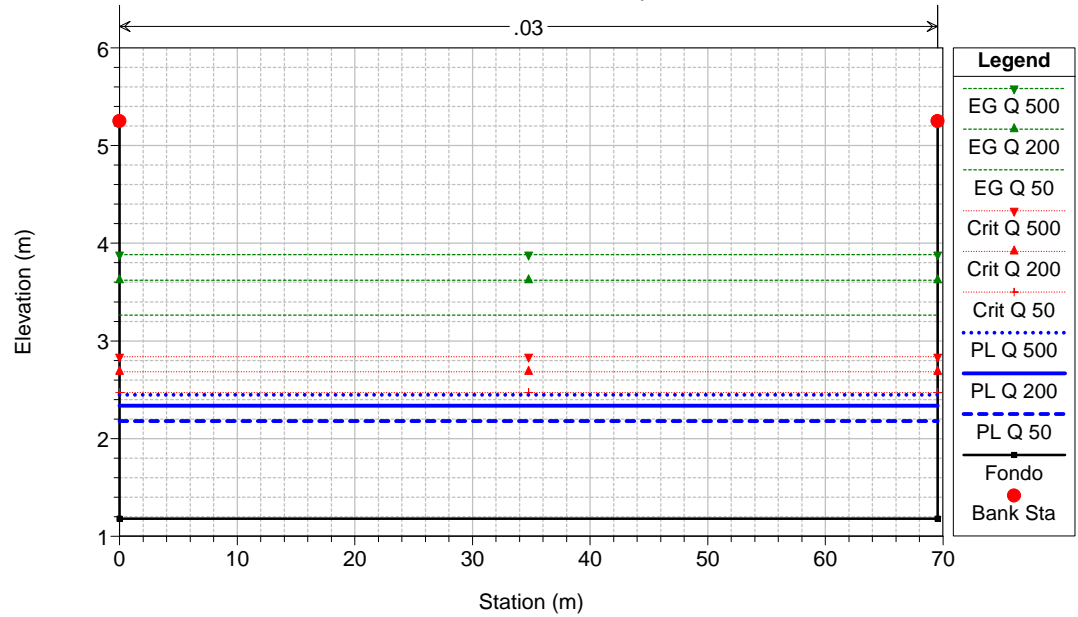




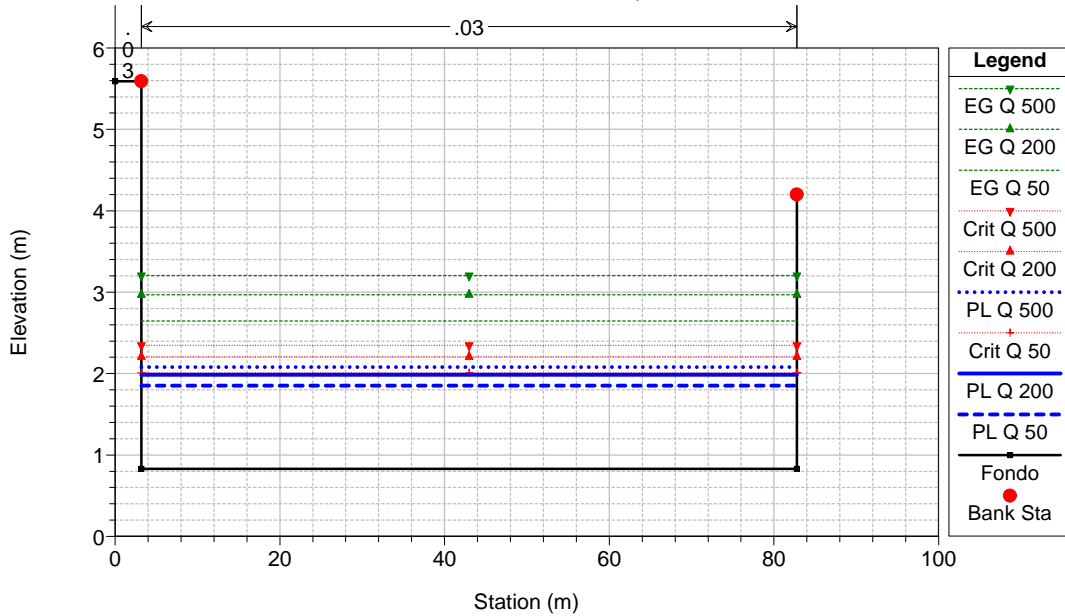
Varenna dalla foce a Chiesino  
River = Varenna Reach = valle treponti VAR-4



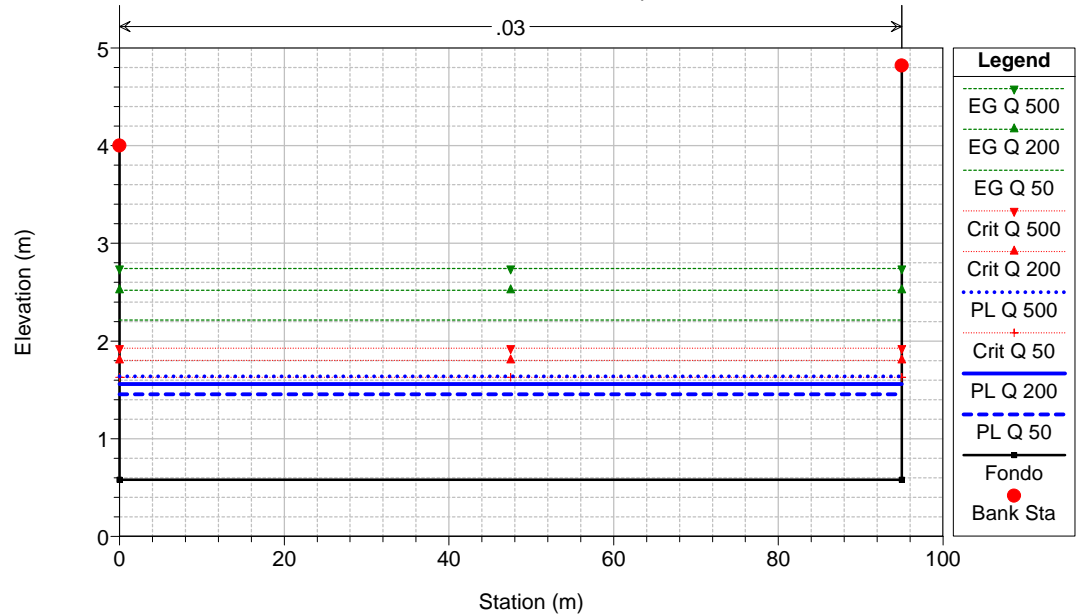
Varenna dalla foce a Chiesino  
River = Varenna Reach = valle treponti VAR-3



Varenna dalla foce a Chiesino  
River = Varenna Reach = valle treponti VAR-2



Varenna dalla foce a Chiesino  
River = Varenna Reach = valle treponti VAR-1



HEC-RAS Plan: 09\_2012 River: Varenna Reach: valle treponti

| Reach          | River Sta     | Profile | Q Total<br>(m3/s) | Min Ch El<br>(m) | W.S. Elev<br>(m) | LOB Elev<br>(m) | L. Freeboard<br>(m) | ROB Elev<br>(m) | R. Freeboard<br>(m) | Crit W.S.<br>(m) | E.G. Elev<br>(m) | E.G. Slope<br>(m/m) | Vel Chnl<br>(m/s) | Flow Area<br>(m2) | Top Width<br>(m) | Froude # Chl |
|----------------|---------------|---------|-------------------|------------------|------------------|-----------------|---------------------|-----------------|---------------------|------------------|------------------|---------------------|-------------------|-------------------|------------------|--------------|
| valle treponti | 1680.9 VAR-65 | Q 50    | 291.00            | 27.05            | 31.22            | 38.85           | 7.63                | 32.68           | 1.46                | 30.77            | 32.13            | 0.004675            | 4.21              | 69.14             | 23.39            | 0.78         |
| valle treponti | 1680.9 VAR-65 | Q 200   | 374.00            | 27.05            | 31.64            | 38.85           | 7.21                | 32.68           | 1.04                | 31.23            | 32.78            | 0.005190            | 4.74              | 78.83             | 23.47            | 0.83         |
| valle treponti | 1680.9 VAR-65 | Q 500   | 438.00            | 27.05            | 32.10            | 38.85           | 6.75                | 32.68           | 0.58                | 31.56            | 33.31            | 0.004822            | 4.88              | 89.75             | 23.56            | 0.80         |
| valle treponti | 1678.1 VAR-64 | Q 50    | 291.00            | 27.12            | 31.28            | 38.85           | 7.57                | 33.82           | 2.54                | 30.66            | 32.08            | 0.003970            | 3.98              | 73.17             | 23.51            | 0.72         |
| valle treponti | 1678.1 VAR-64 | Q 200   | 374.00            | 27.12            | 31.71            | 38.85           | 7.14                | 33.82           | 2.11                | 31.12            | 32.73            | 0.004447            | 4.50              | 83.20             | 23.53            | 0.76         |
| valle treponti | 1678.1 VAR-64 | Q 500   | 438.00            | 27.12            | 32.16            | 38.85           | 6.69                | 33.82           | 1.66                | 31.45            | 33.27            | 0.004234            | 4.66              | 93.99             | 23.55            | 0.74         |
| valle treponti | 1673.6 VAR-63 | Q 50    | 291.00            | 27.27            | 30.92            | 37.65           | 6.73                | 33.78           | 2.86                | 30.92            | 32.03            | 0.007887            | 4.66              | 62.45             | 28.26            | 1.00         |
| valle treponti | 1673.6 VAR-63 | Q 200   | 374.00            | 27.27            | 31.76            | 37.65           | 5.89                | 33.78           | 2.02                | 31.39            | 32.68            | 0.004958            | 4.25              | 87.92             | 31.48            | 0.81         |
| valle treponti | 1673.6 VAR-63 | Q 500   | 438.00            | 27.27            | 32.30            | 37.65           | 5.35                | 33.78           | 1.48                | 31.67            | 33.19            | 0.003933            | 4.18              | 104.85            | 31.50            | 0.73         |
| valle treponti | 1669.0 VAR-62 | Q 50    | 291.00            | 27.29            | 30.46            | 31.69           | 1.23                | 31.06           | 0.60                | 30.68            | 31.95            | 0.010316            | 5.41              | 53.79             | 23.71            | 1.15         |
| valle treponti | 1669.0 VAR-62 | Q 200   | 374.00            | 27.29            | 31.13            | 31.69           | 0.56                | 31.06           | -0.07               | 31.13            | 32.60            | 0.007932            | 5.37              | 69.65             | 23.71            | 1.00         |
| valle treponti | 1669.0 VAR-62 | Q 500   | 438.00            | 27.29            | 31.46            | 31.69           | 0.23                | 31.06           | -0.40               | 31.46            | 33.09            | 0.007884            | 5.66              | 77.41             | 23.71            | 1.00         |
| valle treponti | 1643.5 VAR-61 | Q 50    | 291.00            | 27.47            | 29.24            | 33.85           | 4.61                | 33.85           | 4.61                | 29.88            | 31.44            | 0.021954            | 6.57              | 44.28             | 26.10            | 1.61         |
| valle treponti | 1643.5 VAR-61 | Q 200   | 374.00            | 27.47            | 29.58            | 33.85           | 4.27                | 33.85           | 4.27                | 30.30            | 32.10            | 0.020351            | 7.04              | 53.15             | 26.18            | 1.58         |
| valle treponti | 1643.5 VAR-61 | Q 500   | 438.00            | 27.47            | 29.82            | 33.85           | 4.03                | 33.85           | 4.03                | 30.61            | 32.59            | 0.019767            | 7.38              | 59.33             | 26.23            | 1.57         |
| valle treponti | 1643.0 VAR-61 | Q 50    | 291.00            | 24.81            | 26.15            | 34.00           | 7.85                | 37.03           | 10.88               | 27.42            | 31.14            | 0.068968            | 9.90              | 29.39             | 22.16            | 2.74         |
| valle treponti | 1643.0 VAR-61 | Q 200   | 374.00            | 24.81            | 26.47            | 34.00           | 7.53                | 37.03           | 10.56               | 27.89            | 31.81            | 0.057067            | 10.23             | 36.56             | 22.27            | 2.55         |
| valle treponti | 1643.0 VAR-61 | Q 500   | 438.00            | 24.81            | 26.71            | 34.00           | 7.29                | 37.03           | 10.32               | 28.23            | 32.29            | 0.051232            | 10.47             | 41.83             | 22.36            | 2.44         |
| valle treponti | 1633.0 VAR-60 | Q 50    | 291.00            | 24.66            | 26.84            | 34.00           | 7.16                | 37.03           | 10.19               | 27.93            | 30.24            | 0.028652            | 8.17              | 35.62             | 16.67            | 1.78         |
| valle treponti | 1633.0 VAR-60 | Q 200   | 374.00            | 24.66            | 27.38            | 34.00           | 6.62                | 37.03           | 9.65                | 28.40            | 30.83            | 0.030957            | 8.23              | 45.44             | 22.63            | 1.85         |
| valle treponti | 1633.0 VAR-60 | Q 500   | 438.00            | 24.66            | 27.63            | 34.00           | 6.37                | 37.03           | 9.40                | 28.74            | 31.36            | 0.029155            | 8.55              | 51.25             | 22.72            | 1.82         |
| valle treponti | 1486.0 VAR-59 | Q 50    | 291.00            | 22.39            | 24.69            | 30.44           | 5.75                | 30.17           | 5.48                | 25.11            | 26.58            | 0.014386            | 6.08              | 47.84             | 21.55            | 1.30         |
| valle treponti | 1486.0 VAR-59 | Q 200   | 374.00            | 22.39            | 25.08            | 30.44           | 5.36                | 30.17           | 5.09                | 25.60            | 27.33            | 0.014397            | 6.65              | 56.28             | 21.60            | 1.31         |
| valle treponti | 1486.0 VAR-59 | Q 500   | 438.00            | 22.39            | 25.36            | 30.44           | 5.08                | 30.17           | 4.81                | 25.94            | 27.88            | 0.014417            | 7.02              | 62.37             | 21.64            | 1.32         |
| valle treponti | 1386.0 VAR-58 | Q 50    | 291.00            | 20.58            | 23.61            | 28.38           | 4.77                | 28.11           | 4.50                | 23.61            | 24.76            | 0.008443            | 4.73              | 61.48             | 26.94            | 1.00         |
| valle treponti | 1386.0 VAR-58 | Q 200   | 374.00            | 20.58            | 24.03            | 28.38           | 4.35                | 28.11           | 4.08                | 24.03            | 25.38            | 0.008257            | 5.15              | 72.69             | 26.94            | 1.00         |
| valle treponti | 1386.0 VAR-58 | Q 500   | 438.00            | 20.58            | 24.49            | 28.38           | 3.89                | 28.11           | 3.62                | 24.49            | 25.80            | 0.008238            | 5.06              | 86.51             | 33.14            | 1.00         |
| valle treponti | 1319.0 VAR-57 | Q 50    | 291.00            | 19.50            | 22.19            | 26.89           | 4.70                | 26.81           | 4.62                | 22.51            | 23.51            | 0.015800            | 5.09              | 57.20             | 39.00            | 1.34         |
| valle treponti | 1319.0 VAR-57 | Q 200   | 374.00            | 19.50            | 22.41            | 26.89           | 4.48                | 26.81           | 4.40                | 22.84            | 24.06            | 0.016762            | 5.70              | 65.58             | 39.00            | 1.40         |
| valle treponti | 1319.0 VAR-57 | Q 500   | 438.00            | 19.50            | 22.56            | 26.89           | 4.33                | 26.81           | 4.25                | 23.07            | 24.47            | 0.017393            | 6.12              | 71.51             | 39.00            | 1.44         |
| valle treponti | 1238.0        | Q 50    | 291.00            | 19.26            | 21.78            | 22.92           | 1.14                | 24.36           | 2.58                | 21.78            | 22.81            | 0.008428            | 4.48              | 64.91             | 31.69            | 1.00         |
| valle treponti | 1238.0        | Q 200   | 374.00            | 19.26            | 22.15            | 22.92           | 0.77                | 24.36           | 2.21                | 22.15            | 23.37            | 0.008215            | 4.88              | 76.65             | 31.69            | 1.00         |
| valle treponti | 1238.0        | Q 500   | 438.00            | 19.26            | 22.43            | 22.92           | 0.50                | 24.36           | 1.94                | 22.43            | 23.77            | 0.008046            | 5.14              | 85.29             | 31.69            | 1.00         |
| valle treponti | 1213.0 VAR-56 | Q 50    | 291.00            | 19.19            | 21.40            | 22.85           | 1.45                | 24.29           | 2.89                | 21.40            | 22.43            | 0.007935            | 4.48              | 64.93             | 31.69            | 1.00         |
| valle treponti | 1213.0 VAR-56 | Q 200   | 374.00            | 19.19            | 21.77            | 22.85           | 1.08                | 24.29           | 2.52                | 21.77            | 22.99            | 0.007757            | 4.88              | 76.64             | 31.69            | 1.00         |
| valle treponti | 1213.0 VAR-56 | Q 500   | 438.00            | 19.19            | 22.04            | 22.85           | 0.81                | 24.29           | 2.25                | 22.04            | 23.39            | 0.007619            | 5.14              | 85.22             | 31.69            | 1.00         |

HEC-RAS Plan: 09\_2012 River: Varenna Reach: valle treponti (Continued)

| Reach          | River Sta     | Profile | Q Total<br>(m3/s) | Min Ch El<br>(m) | W.S. Elev<br>(m) | LOB Elev<br>(m) | L. Freeboard<br>(m) | ROB Elev<br>(m) | R. Freeboard<br>(m) | Crit W.S.<br>(m) | E.G. Elev<br>(m) | E.G. Slope<br>(m/m) | Vel Chnl<br>(m/s) | Flow Area<br>(m2) | Top Width<br>(m) | Froude # Chl |
|----------------|---------------|---------|-------------------|------------------|------------------|-----------------|---------------------|-----------------|---------------------|------------------|------------------|---------------------|-------------------|-------------------|------------------|--------------|
| valle treponti | 1212.8 VAR-55 | Q 50    | 291.00            | 17.98            | 19.76            | 22.85           | 3.09                | 24.29           | 4.53                | 20.50            | 22.27            | 0.035024            | 7.03              | 41.41             | 32.09            | 1.97         |
| valle treponti | 1212.8 VAR-55 | Q 200   | 374.00            | 17.98            | 20.04            | 22.85           | 2.81                | 24.29           | 4.25                | 20.87            | 22.83            | 0.030268            | 7.39              | 50.62             | 32.09            | 1.88         |
| valle treponti | 1212.8 VAR-55 | Q 500   | 438.00            | 17.98            | 20.26            | 22.85           | 2.59                | 24.29           | 4.04                | 21.14            | 23.22            | 0.027790            | 7.63              | 57.37             | 32.09            | 1.82         |
| valle treponti | 1189.8 VAR-54 | Q 50    | 291.00            | 17.72            | 19.37            | 22.60           | 3.23                | 24.44           | 5.07                | 19.98            | 21.44            | 0.024174            | 6.38              | 45.60             | 31.55            | 1.69         |
| valle treponti | 1189.8 VAR-54 | Q 200   | 374.00            | 17.72            | 19.63            | 22.60           | 2.97                | 24.44           | 4.81                | 20.35            | 22.09            | 0.023478            | 6.95              | 53.81             | 31.62            | 1.70         |
| valle treponti | 1189.8 VAR-54 | Q 500   | 438.00            | 17.72            | 19.82            | 22.60           | 2.78                | 24.44           | 4.62                | 20.62            | 22.54            | 0.022781            | 7.30              | 59.98             | 31.68            | 1.69         |
| valle treponti | 1173.9 VAR-53 | Q 50    | 291.00            | 17.62            | 19.46            | 22.19           | 2.73                | 24.18           | 4.72                | 19.84            | 20.97            | 0.014594            | 5.44              | 53.48             | 32.44            | 1.35         |
| valle treponti | 1173.9 VAR-53 | Q 200   | 374.00            | 17.62            | 19.69            | 22.19           | 2.50                | 24.18           | 4.49                | 20.27            | 21.61            | 0.015927            | 6.14              | 60.95             | 32.71            | 1.43         |
| valle treponti | 1173.9 VAR-53 | Q 500   | 438.00            | 17.62            | 19.86            | 22.19           | 2.33                | 24.18           | 4.32                | 20.52            | 22.07            | 0.016539            | 6.58              | 66.56             | 32.91            | 1.48         |
| valle treponti | 1144.2 VAR-52 | Q 50    | 291.00            | 17.45            | 19.24            | 20.52           | 1.28                | 23.77           | 4.53                | 19.53            | 20.51            | 0.012723            | 4.99              | 58.31             | 36.21            | 1.26         |
| valle treponti | 1144.2 VAR-52 | Q 200   | 374.00            | 17.45            | 19.45            | 20.52           | 1.07                | 23.77           | 4.32                | 19.86            | 21.08            | 0.014898            | 5.66              | 66.13             | 38.16            | 1.37         |
| valle treponti | 1144.2 VAR-52 | Q 500   | 438.00            | 17.45            | 19.59            | 20.52           | 0.93                | 23.77           | 4.18                | 20.10            | 21.51            | 0.015970            | 6.13              | 71.41             | 38.25            | 1.43         |
| valle treponti | 1117.6 VAR-51 | Q 50    | 291.00            | 17.03            | 18.57            | 19.78           | 1.21                | 23.20           | 4.63                | 18.97            | 20.07            | 0.017235            | 5.44              | 53.52             | 36.77            | 1.44         |
| valle treponti | 1117.6 VAR-51 | Q 200   | 374.00            | 17.03            | 18.81            | 19.78           | 0.97                | 23.20           | 4.39                | 19.34            | 20.64            | 0.017296            | 5.99              | 62.48             | 36.97            | 1.47         |
| valle treponti | 1117.6 VAR-51 | Q 500   | 438.00            | 17.03            | 18.98            | 19.78           | 0.80                | 23.20           | 4.22                | 19.58            | 21.05            | 0.017420            | 6.37              | 68.80             | 37.10            | 1.49         |
| valle treponti | 1089.9 VAR-50 | Q 50    | 291.00            | 16.45            | 18.08            | 20.20           | 2.12                | 23.20           | 5.12                | 18.49            | 19.58            | 0.018307            | 5.43              | 53.56             | 38.80            | 1.48         |
| valle treponti | 1089.9 VAR-50 | Q 200   | 374.00            | 16.45            | 18.31            | 20.20           | 1.89                | 23.20           | 4.89                | 18.82            | 20.14            | 0.018507            | 5.99              | 62.39             | 39.07            | 1.51         |
| valle treponti | 1089.9 VAR-50 | Q 500   | 438.00            | 16.45            | 18.46            | 20.20           | 1.74                | 23.20           | 4.74                | 19.09            | 20.54            | 0.018836            | 6.40              | 68.47             | 39.26            | 1.55         |
| valle treponti | 1059.4 VAR-49 | Q 50    | 291.00            | 15.81            | 17.29            | 20.05           | 2.76                | 22.80           | 5.51                | 17.77            | 18.94            | 0.022402            | 5.69              | 51.18             | 40.66            | 1.62         |
| valle treponti | 1059.4 VAR-49 | Q 200   | 374.00            | 15.81            | 17.50            | 20.05           | 2.55                | 22.80           | 5.30                | 18.09            | 19.49            | 0.022278            | 6.25              | 59.86             | 40.89            | 1.65         |
| valle treponti | 1059.4 VAR-49 | Q 500   | 438.00            | 15.81            | 17.65            | 20.05           | 2.40                | 22.80           | 5.15                | 18.31            | 19.89            | 0.022253            | 6.63              | 66.05             | 41.05            | 1.67         |
| valle treponti | 1027.6 VAR-48 | Q 50    | 291.00            | 14.85            | 16.35            | 20.63           | 4.28                | 22.06           | 5.71                | 16.90            | 18.18            | 0.024135            | 5.99              | 48.61             | 38.15            | 1.69         |
| valle treponti | 1027.6 VAR-48 | Q 200   | 374.00            | 14.85            | 16.58            | 20.63           | 4.05                | 22.06           | 5.48                | 17.23            | 18.75            | 0.023363            | 6.52              | 57.36             | 38.38            | 1.70         |
| valle treponti | 1027.6 VAR-48 | Q 500   | 438.00            | 14.85            | 16.75            | 20.63           | 3.88                | 22.06           | 5.31                | 17.47            | 19.16            | 0.022890            | 6.88              | 63.69             | 38.54            | 1.71         |
| valle treponti | 1000.6 VAR-47 | Q 50    | 291.00            | 14.66            | 16.85            | 19.72           | 2.87                | 21.54           | 4.69                | 16.85            | 17.78            | 0.007595            | 4.28              | 68.00             | 36.45            | 1.00         |
| valle treponti | 1000.6 VAR-47 | Q 200   | 374.00            | 14.66            | 17.20            | 19.72           | 2.52                | 21.54           | 4.34                | 17.20            | 18.29            | 0.007274            | 4.63              | 80.81             | 36.97            | 1.00         |
| valle treponti | 1000.6 VAR-47 | Q 500   | 438.00            | 14.66            | 17.44            | 19.72           | 2.28                | 21.54           | 4.10                | 17.44            | 18.65            | 0.007108            | 4.87              | 90.03             | 37.34            | 1.00         |
| valle treponti | 975.0 VAR-46  | Q 50    | 291.00            | 14.29            | 15.78            | 18.68           | 2.90                | 20.90           | 5.12                | 16.22            | 17.33            | 0.020729            | 5.50              | 52.89             | 41.93            | 1.56         |
| valle treponti | 975.0 VAR-46  | Q 200   | 374.00            | 14.29            | 16.01            | 18.68           | 2.67                | 20.90           | 4.89                | 16.53            | 17.84            | 0.019924            | 5.98              | 62.51             | 42.09            | 1.57         |
| valle treponti | 975.0 VAR-46  | Q 500   | 438.00            | 14.29            | 16.18            | 18.68           | 2.50                | 20.90           | 4.72                | 16.76            | 18.20            | 0.019470            | 6.31              | 69.43             | 42.20            | 1.57         |
| valle treponti | 943.8 VAR-45  | Q 50    | 291.00            | 14.00            | 16.24            | 18.79           | 2.55                | 20.09           | 3.85                | 15.87            | 16.76            | 0.003996            | 3.18              | 91.50             | 47.24            | 0.73         |
| valle treponti | 943.8 VAR-45  | Q 200   | 374.00            | 14.00            | 16.58            | 18.79           | 2.21                | 20.09           | 3.51                | 16.16            | 17.20            | 0.003949            | 3.48              | 107.32            | 47.27            | 0.74         |
| valle treponti | 943.8 VAR-45  | Q 500   | 438.00            | 14.00            | 15.97            | 18.79           | 2.82                | 20.09           | 4.12                | 16.37            | 17.55            | 0.014721            | 5.56              | 78.73             | 47.21            | 1.38         |
| valle treponti | 927.1 VAR-44  | Q 50    | 321.00            | 13.78            | 15.79            | 17.20           | 1.41                | 19.05           | 3.26                | 15.76            | 16.64            | 0.007398            | 4.07              | 78.88             | 44.55            | 0.98         |
| valle treponti | 927.1 VAR-44  | Q 200   | 404.00            | 13.78            | 16.06            | 17.20           | 1.14                | 19.05           | 2.99                | 16.06            | 17.07            | 0.007488            | 4.46              | 90.65             | 44.70            | 1.00         |
| valle treponti | 927.1 VAR-44  | Q 500   | 468.00            | 13.78            | 16.27            | 17.20           | 0.93                | 19.05           | 2.78                | 16.27            | 17.38            | 0.007320            | 4.68              | 100.05            | 44.82            | 1.00         |



HEC-RAS Plan: 09\_2012 River: Varenna Reach: valle treponti (Continued)

| Reach          | River Sta |        | Profile | Q Total<br>(m3/s) | Min Ch El<br>(m) | W.S. Elev<br>(m) | LOB Elev<br>(m) | L. Freeboard<br>(m) | ROB Elev<br>(m) | R. Freeboard<br>(m) | Crit W.S.<br>(m) | E.G. Elev<br>(m) | E.G. Slope<br>(m/m) | Vel Chnl<br>(m/s) | Flow Area<br>(m2) | Top Width<br>(m) | Froude # Chl |
|----------------|-----------|--------|---------|-------------------|------------------|------------------|-----------------|---------------------|-----------------|---------------------|------------------|------------------|---------------------|-------------------|-------------------|------------------|--------------|
| valle treponti | 849.1     | VAR-43 | Q 50    | 321.00            | 13.50            | 15.23            | 17.22           | 1.99                | 18.00           | 2.77                | 15.23            | 16.07            | 0.008115            | 4.04              | 79.36             | 47.50            | 1.00         |
| valle treponti | 849.1     | VAR-43 | Q 200   | 404.00            | 13.50            | 15.51            | 17.22           | 1.71                | 18.00           | 2.49                | 15.51            | 16.48            | 0.007831            | 4.37              | 92.48             | 47.50            | 1.00         |
| valle treponti | 849.1     | VAR-43 | Q 500   | 468.00            | 13.50            | 15.71            | 17.22           | 1.51                | 18.00           | 2.29                | 15.71            | 16.78            | 0.007671            | 4.59              | 101.95            | 47.50            | 1.00         |
| valle treponti | 848.9     |        | Q 50    | 321.00            | 11.04            | 11.88            | 17.22           | 5.34                | 18.00           | 6.12                | 12.78            | 15.76            | 0.100651            | 8.72              | 36.80             | 47.50            | 3.16         |
| valle treponti | 848.9     |        | Q 200   | 404.00            | 11.04            | 12.05            | 17.22           | 5.17                | 18.00           | 5.95                | 13.05            | 16.16            | 0.082468            | 8.98              | 44.97             | 47.50            | 2.95         |
| valle treponti | 848.9     |        | Q 500   | 468.00            | 11.04            | 12.18            | 17.22           | 5.04                | 18.00           | 5.82                | 13.25            | 16.46            | 0.072865            | 9.16              | 51.08             | 47.50            | 2.82         |
| valle treponti | 837.9     | VAR-42 | Q 50    | 321.00            | 10.75            | 11.81            | 17.45           | 5.64                | 17.55           | 5.74                | 12.62            | 14.70            | 0.050593            | 7.53              | 42.62             | 40.20            | 2.34         |
| valle treponti | 837.9     | VAR-42 | Q 200   | 404.00            | 10.75            | 12.01            | 17.45           | 5.44                | 17.55           | 5.54                | 12.93            | 15.24            | 0.045404            | 7.96              | 50.73             | 40.20            | 2.26         |
| valle treponti | 837.9     | VAR-42 | Q 500   | 468.00            | 10.75            | 12.16            | 17.45           | 5.29                | 17.55           | 5.39                | 13.15            | 15.61            | 0.041991            | 8.23              | 56.88             | 40.20            | 2.21         |
| valle treponti | 836.9     |        | Q 50    | 321.00            | 10.73            | 11.80            | 16.55           | 4.75                | 16.55           | 4.75                | 12.59            | 14.63            | 0.048938            | 7.46              | 43.05             | 40.20            | 2.30         |
| valle treponti | 836.9     |        | Q 200   | 404.00            | 10.73            | 12.00            | 16.55           | 4.55                | 16.55           | 4.55                | 12.90            | 15.18            | 0.044278            | 7.90              | 51.12             | 40.20            | 2.24         |
| valle treponti | 836.9     |        | Q 500   | 468.00            | 10.73            | 12.15            | 16.55           | 4.40                | 16.55           | 4.40                | 13.13            | 15.56            | 0.041244            | 8.18              | 57.20             | 40.20            | 2.19         |
| valle treponti | 833.1     |        | Bridge  |                   |                  |                  |                 |                     |                 |                     |                  |                  |                     |                   |                   |                  |              |
| valle treponti | 829.9     | VAR-41 | Q 50    | 321.00            | 10.73            | 11.96            | 16.55           | 4.59                | 16.55           | 4.59                | 12.60            | 14.11            | 0.031310            | 6.50              | 49.37             | 40.20            | 1.87         |
| valle treponti | 829.9     | VAR-41 | Q 200   | 404.00            | 10.73            | 12.17            | 16.55           | 4.38                | 16.55           | 4.38                | 12.90            | 14.66            | 0.029727            | 6.99              | 57.79             | 40.20            | 1.86         |
| valle treponti | 829.9     | VAR-41 | Q 500   | 468.00            | 10.73            | 12.33            | 16.55           | 4.22                | 16.55           | 4.22                | 13.13            | 15.03            | 0.028337            | 7.29              | 64.22             | 40.20            | 1.84         |
| valle treponti | 828.9     | VAR-40 | Q 50    | 321.00            | 10.63            | 11.85            | 17.17           | 5.32                | 17.37           | 5.52                | 12.51            | 14.07            | 0.037649            | 6.60              | 48.63             | 39.85            | 1.91         |
| valle treponti | 828.9     | VAR-40 | Q 200   | 404.00            | 10.63            | 12.06            | 17.17           | 5.11                | 17.37           | 5.31                | 12.87            | 14.62            | 0.036323            | 7.08              | 57.03             | 39.85            | 1.89         |
| valle treponti | 828.9     | VAR-40 | Q 500   | 468.00            | 10.63            | 12.22            | 17.17           | 4.95                | 17.37           | 5.15                | 13.09            | 14.99            | 0.035091            | 7.38              | 63.44             | 39.85            | 1.87         |
| valle treponti | 826.3     | VAR-39 | Q 50    | 321.00            | 10.60            | 11.71            | 17.15           | 5.44                | 17.34           | 5.63                | 12.37            | 13.97            | 0.037029            | 6.66              | 48.23             | 43.40            | 2.02         |
| valle treponti | 826.3     | VAR-39 | Q 200   | 404.00            | 10.60            | 11.90            | 17.15           | 5.25                | 17.34           | 5.44                | 12.66            | 14.52            | 0.035278            | 7.17              | 56.36             | 43.40            | 2.01         |
| valle treponti | 826.3     | VAR-39 | Q 500   | 468.00            | 10.60            | 12.04            | 17.15           | 5.11                | 17.34           | 5.30                | 12.88            | 14.89            | 0.033740            | 7.48              | 62.54             | 43.40            | 1.99         |
| valle treponti | 781.6     | VAR-38 | Q 50    | 321.00            | 10.00            | 11.57            | 15.06           | 3.49                | 14.46           | 2.89                | 11.80            | 12.75            | 0.012508            | 4.82              | 66.65             | 42.55            | 1.23         |
| valle treponti | 781.6     | VAR-38 | Q 200   | 404.00            | 10.00            | 11.77            | 15.06           | 3.29                | 14.46           | 2.69                | 12.10            | 13.25            | 0.013507            | 5.38              | 75.03             | 42.59            | 1.30         |
| valle treponti | 781.6     | VAR-38 | Q 500   | 468.00            | 10.00            | 11.92            | 15.06           | 3.14                | 14.46           | 2.54                | 12.31            | 13.60            | 0.014006            | 5.76              | 81.27             | 42.63            | 1.33         |
| valle treponti | 764.1     | VAR-37 | Q 50    | 321.00            | 9.76             | 11.35            | 14.80           | 3.45                | 13.98           | 2.63                | 11.57            | 12.53            | 0.012218            | 4.80              | 66.87             | 42.13            | 1.22         |
| valle treponti | 764.1     | VAR-37 | Q 200   | 404.00            | 9.76             | 11.56            | 14.80           | 3.24                | 13.98           | 2.42                | 11.87            | 13.01            | 0.012960            | 5.34              | 75.70             | 42.18            | 1.27         |
| valle treponti | 764.1     | VAR-37 | Q 500   | 468.00            | 9.76             | 11.73            | 14.80           | 3.07                | 13.98           | 2.25                | 12.09            | 13.36            | 0.013108            | 5.66              | 82.65             | 42.22            | 1.29         |
| valle treponti | 757.3     | VAR-36 | Q 50    | 321.00            | 9.67             | 11.20            | 14.74           | 3.54                | 13.80           | 2.60                | 11.46            | 12.44            | 0.013621            | 4.94              | 65.02             | 42.57            | 1.27         |
| valle treponti | 757.3     | VAR-36 | Q 200   | 404.00            | 9.67             | 11.42            | 14.74           | 3.32                | 13.80           | 2.38                | 11.76            | 12.93            | 0.014063            | 5.44              | 74.21             | 42.59            | 1.32         |
| valle treponti | 757.3     | VAR-36 | Q 500   | 468.00            | 9.67             | 11.58            | 14.74           | 3.16                | 13.80           | 2.22                | 11.98            | 13.27            | 0.014118            | 5.76              | 81.19             | 42.60            | 1.33         |
| valle treponti | 752.2     | VAR-35 | Q 50    | 321.00            | 9.60             | 11.21            | 14.65           | 3.44                | 13.68           | 2.47                | 11.42            | 12.37            | 0.011948            | 4.78              | 67.19             | 41.92            | 1.20         |
| valle treponti | 752.2     | VAR-35 | Q 200   | 404.00            | 9.60             | 11.50            | 14.65           | 3.15                | 13.68           | 2.18                | 11.72            | 12.82            | 0.011135            | 5.10              | 79.19             | 41.99            | 1.19         |
| valle treponti | 752.2     | VAR-35 | Q 500   | 468.00            | 9.60             | 11.71            | 14.65           | 2.94                | 13.68           | 1.97                | 11.94            | 13.15            | 0.010648            | 5.32              | 87.99             | 42.05            | 1.17         |
| valle treponti | 741.7     | VAR-34 | Q 50    | 321.00            | 9.44             | 11.03            | 14.25           | 3.22                | 13.51           | 2.48                | 11.27            | 12.24            | 0.012686            | 4.88              | 65.80             | 41.66            | 1.24         |
| valle treponti | 741.7     | VAR-34 | Q 200   | 404.00            | 9.44             | 11.30            | 14.25           | 2.95                | 13.51           | 2.21                | 11.57            | 12.70            | 0.012045            | 5.24              | 77.10             | 41.74            | 1.23         |

HEC-RAS Plan: 09\_2012 River: Varenna Reach: valle treponti (Continued)

| Reach          | River Sta |        | Profile | Q Total<br>(m3/s) | Min Ch El<br>(m) | W.S. Elev<br>(m) | LOB Elev<br>(m) | L. Freeboard<br>(m) | ROB Elev<br>(m) | R. Freeboard<br>(m) | Crit W.S.<br>(m) | E.G. Elev<br>(m) | E.G. Slope<br>(m/m) | Vel Chnl<br>(m/s) | Flow Area<br>(m2) | Top Width<br>(m) | Froude # Chl |
|----------------|-----------|--------|---------|-------------------|------------------|------------------|-----------------|---------------------|-----------------|---------------------|------------------|------------------|---------------------|-------------------|-------------------|------------------|--------------|
| valle treponti | 741.7     | VAR-34 | Q 500   | 468.00            | 9.44             | 11.50            | 14.25           | 2.75                | 13.51           | 2.01                | 11.79            | 13.03            | 0.011592            | 5.47              | 85.49             | 41.79            | 1.22         |
| valle treponti | 740.7     | VAR-33 | Q 50    | 321.00            | 9.42             | 11.00            | 14.24           | 3.24                | 13.50           | 2.50                | 11.25            | 12.23            | 0.012924            | 4.91              | 65.42             | 41.64            | 1.25         |
| valle treponti | 740.7     | VAR-33 | Q 200   | 404.00            | 9.42             | 11.27            | 14.24           | 2.97                | 13.50           | 2.23                | 11.55            | 12.68            | 0.012262            | 5.27              | 76.66             | 41.71            | 1.24         |
| valle treponti | 740.7     | VAR-33 | Q 500   | 468.00            | 9.42             | 11.47            | 14.24           | 2.77                | 13.50           | 2.03                | 11.77            | 13.01            | 0.011800            | 5.51              | 85.01             | 41.77            | 1.23         |
| valle treponti | 737.2     | VAR-32 | Q 50    | 321.00            | 9.37             | 10.95            | 14.21           | 3.26                | 13.45           | 2.50                | 11.20            | 12.18            | 0.012826            | 4.90              | 65.53             | 41.56            | 1.25         |
| valle treponti | 737.2     | VAR-32 | Q 200   | 404.00            | 9.37             | 11.22            | 14.21           | 2.99                | 13.45           | 2.23                | 11.50            | 12.64            | 0.012385            | 5.29              | 76.38             | 41.64            | 1.25         |
| valle treponti | 737.2     | VAR-32 | Q 500   | 468.00            | 9.37             | 11.41            | 14.21           | 2.80                | 13.45           | 2.04                | 11.72            | 12.97            | 0.011942            | 5.53              | 84.64             | 41.69            | 1.24         |
| valle treponti | 713.2     | VAR-31 | Q 50    | 321.00            | 9.04             | 10.64            | 13.70           | 3.06                | 13.07           | 2.43                | 10.88            | 11.86            | 0.012778            | 4.91              | 65.40             | 41.19            | 1.24         |
| valle treponti | 713.2     | VAR-31 | Q 200   | 404.00            | 9.04             | 10.88            | 13.70           | 2.82                | 13.07           | 2.19                | 11.18            | 12.34            | 0.012687            | 5.35              | 75.58             | 41.25            | 1.26         |
| valle treponti | 713.2     | VAR-31 | Q 500   | 468.00            | 9.04             | 11.07            | 13.70           | 2.63                | 13.07           | 2.00                | 11.40            | 12.68            | 0.012510            | 5.63              | 83.18             | 41.30            | 1.27         |
| valle treponti | 689.2     | VAR-30 | Q 50    | 321.00            | 8.70             | 10.95            | 13.19           | 2.24                | 12.69           | 1.74                | 10.53            | 11.55            | 0.004077            | 3.43              | 93.71             | 41.96            | 0.73         |
| valle treponti | 689.2     | VAR-30 | Q 200   | 404.00            | 8.70             | 11.29            | 13.19           | 1.90                | 12.69           | 1.40                | 10.84            | 12.00            | 0.004136            | 3.75              | 107.73            | 42.06            | 0.75         |
| valle treponti | 689.2     | VAR-30 | Q 500   | 468.00            | 8.70             | 11.53            | 13.19           | 1.66                | 12.69           | 1.16                | 11.06            | 12.33            | 0.004172            | 3.97              | 117.86            | 42.12            | 0.76         |
| valle treponti | 687.2     | VAR-29 | Q 50    | 321.00            | 8.70             | 10.70            | 13.18           | 2.48                | 12.67           | 1.97                | 10.61            | 11.52            | 0.006853            | 4.02              | 79.92             | 42.03            | 0.93         |
| valle treponti | 687.2     | VAR-29 | Q 200   | 404.00            | 8.70             | 11.02            | 13.18           | 2.16                | 12.67           | 1.65                | 10.91            | 11.97            | 0.006622            | 4.33              | 93.22             | 42.11            | 0.93         |
| valle treponti | 687.2     | VAR-29 | Q 500   | 468.00            | 8.70             | 11.25            | 13.18           | 1.93                | 12.67           | 1.42                | 11.12            | 12.30            | 0.006486            | 4.55              | 102.86            | 42.17            | 0.93         |
| valle treponti | 687       |        | Q 50    | 321.00            | 8.70             | 10.60            | 13.18           | 2.58                | 12.67           | 2.07                | 10.60            | 11.51            | 0.008106            | 4.23              | 75.86             | 42.00            | 1.01         |
| valle treponti | 687       |        | Q 200   | 404.00            | 8.70             | 10.90            | 13.18           | 2.28                | 12.67           | 1.77                | 10.90            | 11.96            | 0.007822            | 4.57              | 88.49             | 42.08            | 1.00         |
| valle treponti | 687       |        | Q 500   | 468.00            | 8.70             | 11.12            | 13.18           | 2.06                | 12.67           | 1.55                | 11.12            | 12.29            | 0.007655            | 4.79              | 97.65             | 42.14            | 1.00         |
| valle treponti | 650.4     | VAR-28 | Q 50    | 321.00            | 8.18             | 10.36            | 12.50           | 2.14                | 12.11           | 1.75                | 9.96             | 10.95            | 0.004179            | 3.41              | 94.15             | 43.38            | 0.74         |
| valle treponti | 650.4     | VAR-28 | Q 200   | 404.00            | 8.18             | 10.71            | 12.50           | 1.79                | 12.11           | 1.40                | 10.25            | 11.41            | 0.004086            | 3.69              | 109.46            | 43.45            | 0.74         |
| valle treponti | 650.4     | VAR-28 | Q 500   | 468.00            | 8.18             | 10.04            | 12.50           | 2.46                | 12.11           | 2.07                | 10.47            | 11.78            | 0.014999            | 5.85              | 80.01             | 43.31            | 1.37         |
| valle treponti | 646.2     | VAR-27 | Q 50    | 321.00            | 8.12             | 10.29            | 12.46           | 2.17                | 12.03           | 1.74                | 9.94             | 10.93            | 0.004644            | 3.56              | 90.15             | 41.63            | 0.77         |
| valle treponti | 646.2     | VAR-27 | Q 200   | 404.00            | 8.12             | 10.60            | 12.46           | 1.86                | 12.03           | 1.43                | 10.25            | 11.38            | 0.004761            | 3.91              | 103.28            | 41.63            | 0.79         |
| valle treponti | 646.2     | VAR-27 | Q 500   | 468.00            | 8.12             | 10.83            | 12.46           | 1.63                | 12.03           | 1.20                | 10.46            | 11.71            | 0.004840            | 4.15              | 112.68            | 41.63            | 0.81         |
| valle treponti | 640.3     | VAR-26 | Q 50    | 321.00            | 8.10             | 10.28            | 12.45           | 2.17                | 12.01           | 1.73                | 9.90             | 10.89            | 0.004312            | 3.46              | 92.77             | 42.65            | 0.75         |
| valle treponti | 640.3     | VAR-26 | Q 200   | 404.00            | 8.10             | 10.61            | 12.45           | 1.84                | 12.01           | 1.40                | 10.20            | 11.34            | 0.004387            | 3.79              | 106.54            | 42.70            | 0.77         |
| valle treponti | 640.3     | VAR-26 | Q 500   | 468.00            | 8.10             | 10.84            | 12.45           | 1.61                | 12.01           | 1.17                | 10.41            | 11.66            | 0.004437            | 4.02              | 116.43            | 42.74            | 0.78         |
| valle treponti | 637.3     | VAR-25 | Q 50    | 321.00            | 8.05             | 9.96             | 12.56           | 2.60                | 11.90           | 1.94                | 9.96             | 10.85            | 0.008008            | 4.18              | 76.79             | 43.14            | 1.00         |
| valle treponti | 637.3     | VAR-25 | Q 200   | 404.00            | 8.05             | 10.25            | 12.56           | 2.31                | 11.90           | 1.65                | 10.25            | 11.29            | 0.007734            | 4.51              | 89.54             | 43.18            | 1.00         |
| valle treponti | 637.3     | VAR-25 | Q 500   | 468.00            | 8.05             | 10.47            | 12.56           | 2.09                | 11.90           | 1.43                | 10.47            | 11.61            | 0.007573            | 4.74              | 98.77             | 43.20            | 1.00         |
| valle treponti | 627.4     | VAR-24 | Q 50    | 321.00            | 7.92             | 9.30             | 12.30           | 3.00                | 11.75           | 2.45                | 9.66             | 10.67            | 0.017114            | 5.18              | 61.94             | 45.21            | 1.41         |
| valle treponti | 627.4     | VAR-24 | Q 200   | 404.00            | 7.92             | 9.54             | 12.30           | 2.76                | 11.75           | 2.21                | 9.94             | 11.12            | 0.016164            | 5.56              | 72.61             | 45.23            | 1.40         |
| valle treponti | 627.4     | VAR-24 | Q 500   | 468.00            | 7.92             | 9.71             | 12.30           | 2.59                | 11.75           | 2.04                | 10.15            | 11.44            | 0.015579            | 5.82              | 80.43             | 45.25            | 1.39         |
| valle treponti | 604.4     | VAR-23 | Q 50    | 321.00            | 7.62             | 9.39             | 12.00           | 2.61                | 11.45           | 2.06                | 9.39             | 10.26            | 0.008866            | 4.14              | 77.52             | 44.37            | 1.00         |
| valle treponti | 604.4     | VAR-23 | Q 200   | 404.00            | 7.62             | 9.72             | 12.00           | 2.28                | 11.45           | 1.73                | 9.68             | 10.70            | 0.008126            | 4.38              | 92.30             | 44.42            | 0.97         |

HEC-RAS Plan: 09\_2012 River: Varenna Reach: valle treponti (Continued)

| Reach          | River Sta |        | Profile | Q Total<br>(m3/s) | Min Ch El<br>(m) | W.S. Elev<br>(m) | LOB Elev<br>(m) | L. Freeboard<br>(m) | ROB Elev<br>(m) | R. Freeboard<br>(m) | Crit W.S.<br>(m) | E.G. Elev<br>(m) | E.G. Slope<br>(m/m) | Vel Chnl<br>(m/s) | Flow Area<br>(m2) | Top Width<br>(m) | Froude # Chl |
|----------------|-----------|--------|---------|-------------------|------------------|------------------|-----------------|---------------------|-----------------|---------------------|------------------|------------------|---------------------|-------------------|-------------------|------------------|--------------|
| valle treponti | 604.4     | VAR-23 | Q 500   | 468.00            | 7.62             | 9.96             | 12.00           | 2.04                | 11.45           | 1.49                | 9.89             | 11.02            | 0.007780            | 4.55              | 102.87            | 44.46            | 0.95         |
| valle treponti | 580.0     | VAR-22 | Q 50    | 321.00            | 7.30             | 9.15             | 11.28           | 2.13                | 11.97           | 2.82                | 9.15             | 10.03            | 0.007797            | 4.17              | 76.98             | 43.50            | 1.00         |
| valle treponti | 580.0     | VAR-22 | Q 200   | 404.00            | 7.30             | 9.45             | 11.28           | 1.83                | 11.97           | 2.52                | 9.45             | 10.47            | 0.007499            | 4.49              | 89.98             | 43.88            | 1.00         |
| valle treponti | 580.0     | VAR-22 | Q 500   | 468.00            | 7.30             | 9.66             | 11.28           | 1.62                | 11.97           | 2.31                | 9.66             | 10.79            | 0.007300            | 4.70              | 99.53             | 44.16            | 1.00         |
| valle treponti | 550.2     | VAR-21 | Q 50    | 321.00            | 6.70             | 8.10             | 11.02           | 2.92                | 11.36           | 3.26                | 8.50             | 9.54             | 0.018953            | 5.30              | 60.52             | 47.09            | 1.49         |
| valle treponti | 550.2     | VAR-21 | Q 200   | 404.00            | 6.70             | 8.32             | 11.02           | 2.70                | 11.36           | 3.04                | 8.78             | 9.98             | 0.018245            | 5.72              | 70.57             | 47.36            | 1.50         |
| valle treponti | 550.2     | VAR-21 | Q 500   | 468.00            | 6.70             | 8.47             | 11.02           | 2.55                | 11.36           | 2.89                | 8.98             | 10.31            | 0.017755            | 6.00              | 77.96             | 47.55            | 1.50         |
| valle treponti | 520.4     | VAR-20 | Q 50    | 321.00            | 6.32             | 7.67             | 10.82           | 3.15                | 10.94           | 3.27                | 8.01             | 8.95             | 0.017732            | 5.03              | 63.88             | 51.26            | 1.44         |
| valle treponti | 520.4     | VAR-20 | Q 200   | 404.00            | 6.32             | 7.84             | 10.82           | 2.98                | 10.94           | 3.10                | 8.27             | 9.41             | 0.018304            | 5.54              | 72.86             | 51.44            | 1.49         |
| valle treponti | 520.4     | VAR-20 | Q 500   | 468.00            | 6.32             | 7.97             | 10.82           | 2.85                | 10.94           | 2.97                | 8.47             | 9.74             | 0.018643            | 5.90              | 79.33             | 51.57            | 1.52         |
| valle treponti | 470.7     | VAR-19 | Q 50    | 321.00            | 5.70             | 7.12             | 9.94            | 2.82                | 10.34           | 3.22                | 7.35             | 8.17             | 0.013701            | 4.55              | 70.50             | 54.08            | 1.27         |
| valle treponti | 470.7     | VAR-19 | Q 200   | 404.00            | 5.70             | 7.31             | 9.94            | 2.63                | 10.34           | 3.03                | 7.60             | 8.58             | 0.013727            | 4.98              | 81.15             | 54.28            | 1.30         |
| valle treponti | 470.7     | VAR-19 | Q 500   | 468.00            | 5.70             | 7.43             | 9.94            | 2.51                | 10.34           | 2.91                | 7.79             | 8.89             | 0.014367            | 5.34              | 87.61             | 54.41            | 1.34         |
| valle treponti | 434.5     | VAR-18 | Q 50    | 321.00            | 5.23             | 6.65             | 9.44            | 2.79                | 9.93            | 3.28                | 6.87             | 7.68             | 0.013933            | 4.49              | 71.48             | 56.82            | 1.28         |
| valle treponti | 434.5     | VAR-18 | Q 200   | 404.00            | 5.23             | 6.84             | 9.44            | 2.60                | 9.93            | 3.09                | 7.12             | 8.06             | 0.013734            | 4.89              | 82.67             | 57.03            | 1.30         |
| valle treponti | 434.5     | VAR-18 | Q 500   | 468.00            | 5.23             | 6.96             | 9.44            | 2.48                | 9.93            | 2.97                | 7.30             | 8.36             | 0.014260            | 5.23              | 89.46             | 57.15            | 1.33         |
| valle treponti | 417.5     | VAR-17 | Q 50    | 321.00            | 4.58             | 6.77             | 9.12            | 2.35                | 9.80            | 3.03                | 6.77             | 7.50             | 0.008237            | 3.79              | 84.77             | 57.96            | 1.00         |
| valle treponti | 417.5     | VAR-17 | Q 200   | 404.00            | 4.58             | 7.01             | 9.12            | 2.11                | 9.80            | 2.79                | 7.01             | 7.86             | 0.007900            | 4.08              | 98.91             | 58.21            | 1.00         |
| valle treponti | 417.5     | VAR-17 | Q 500   | 468.00            | 4.58             | 7.19             | 9.12            | 1.93                | 9.80            | 2.61                | 7.19             | 8.12             | 0.007686            | 4.28              | 109.23            | 58.39            | 1.00         |
| valle treponti | 379.6     | VAR-16 | Q 50    | 321.00            | 4.40             | 6.75             | 8.60            | 1.85                | 9.40            | 2.65                | 6.31             | 7.15             | 0.003327            | 2.78              | 115.40            | 63.47            | 0.66         |
| valle treponti | 379.6     | VAR-16 | Q 200   | 404.00            | 4.40             | 7.03             | 8.60            | 1.57                | 9.40            | 2.37                | 6.54             | 7.50             | 0.003320            | 3.04              | 133.09            | 63.76            | 0.67         |
| valle treponti | 379.6     | VAR-16 | Q 500   | 468.00            | 4.40             | 7.24             | 8.60            | 1.36                | 9.40            | 2.16                | 6.70             | 7.76             | 0.003290            | 3.20              | 146.19            | 63.98            | 0.68         |
| valle treponti | 358.0     | VAR-15 | Q 50    | 321.00            | 4.64             | 6.55             | 8.65            | 2.10                | 8.56            | 2.01                | 6.33             | 7.05             | 0.005122            | 3.13              | 102.50            | 65.65            | 0.80         |
| valle treponti | 358.0     | VAR-15 | Q 200   | 404.00            | 4.64             | 6.87             | 8.65            | 1.78                | 8.56            | 1.69                | 6.56             | 7.42             | 0.004403            | 3.27              | 123.69            | 65.99            | 0.76         |
| valle treponti | 358.0     | VAR-15 | Q 500   | 468.00            | 4.64             | 7.10             | 8.65            | 1.55                | 8.56            | 1.46                | 6.72             | 7.68             | 0.004100            | 3.38              | 138.46            | 66.22            | 0.75         |
| valle treponti | 356.3     |        | Q 50    | 321.00            | 4.50             | 6.54             | 8.65            | 2.11                | 9.50            | 2.96                | 6.27             | 7.04             | 0.004763            | 3.15              | 102.05            | 60.90            | 0.78         |
| valle treponti | 356.3     |        | Q 200   | 404.00            | 4.50             | 6.82             | 8.65            | 1.83                | 9.50            | 2.68                | 6.51             | 7.40             | 0.004561            | 3.39              | 119.13            | 61.07            | 0.78         |
| valle treponti | 356.3     |        | Q 500   | 468.00            | 4.50             | 7.02             | 8.65            | 1.63                | 9.50            | 2.48                | 6.68             | 7.67             | 0.004459            | 3.56              | 131.36            | 61.19            | 0.78         |
| valle treponti | 354.8     | VAR-14 |         | Bridge            |                  |                  |                 |                     |                 |                     |                  |                  |                     |                   |                   |                  |              |
| valle treponti | 353.3     |        | Q 50    | 321.00            | 4.50             | 6.15             | 8.65            | 2.50                | 9.50            | 3.35                | 6.27             | 7.00             | 0.011136            | 4.08              | 78.68             | 60.68            | 1.14         |
| valle treponti | 353.3     |        | Q 200   | 404.00            | 4.50             | 6.37             | 8.65            | 2.28                | 9.50            | 3.13                | 6.51             | 7.36             | 0.010683            | 4.40              | 91.73             | 60.80            | 1.14         |
| valle treponti | 353.3     |        | Q 500   | 468.00            | 4.50             | 6.52             | 8.65            | 2.13                | 9.50            | 2.98                | 6.68             | 7.61             | 0.010399            | 4.62              | 101.21            | 60.89            | 1.14         |
| valle treponti | 303.4     | VAR-13 | Q 50    | 321.00            | 3.40             | 5.17             | 9.11            | 3.94                | 8.60            | 3.43                | 5.44             | 6.22             | 0.016776            | 4.54              | 70.67             | 63.52            | 1.37         |
| valle treponti | 303.4     | VAR-13 | Q 200   | 404.00            | 3.40             | 5.34             | 9.11            | 3.77                | 8.60            | 3.26                | 5.66             | 6.59             | 0.016616            | 4.95              | 81.57             | 63.69            | 1.40         |
| valle treponti | 303.4     | VAR-13 | Q 500   | 468.00            | 3.40             | 5.47             | 9.11            | 3.64                | 8.60            | 3.13                | 5.83             | 6.86             | 0.016366            | 5.22              | 89.66             | 63.82            | 1.41         |

HEC-RAS Plan: 09\_2012 River: Varenna Reach: valle treponti (Continued)

| Reach          | River Sta |        | Profile | Q Total<br>(m3/s) | Min Ch El<br>(m) | W.S. Elev<br>(m) | LOB Elev<br>(m) | L. Freeboard<br>(m) | ROB Elev<br>(m) | R. Freeboard<br>(m) | Crit W.S.<br>(m) | E.G. Elev<br>(m) | E.G. Slope<br>(m/m) | Vel Chnl<br>(m/s) | Flow Area<br>(m2) | Top Width<br>(m) | Froude # Chl |
|----------------|-----------|--------|---------|-------------------|------------------|------------------|-----------------|---------------------|-----------------|---------------------|------------------|------------------|---------------------|-------------------|-------------------|------------------|--------------|
| valle treponti | 271.6     | VAR-12 | Q 50    | 321.00            | 3.30             | 5.20             | 8.91            | 3.71                | 5.91            | 0.71                | 5.20             | 5.90             | 0.008433            | 3.71              | 86.44             | 61.40            | 1.00         |
| valle treponti | 271.6     | VAR-12 | Q 200   | 404.00            | 3.30             | 5.43             | 8.91            | 3.48                | 5.91            | 0.48                | 5.43             | 6.25             | 0.008103            | 4.01              | 100.71            | 61.40            | 1.00         |
| valle treponti | 271.6     | VAR-12 | Q 500   | 468.00            | 3.30             | 5.92             | 8.91            | 2.99                | 5.91            | -0.01               | 5.60             | 6.47             | 0.004293            | 3.32              | 147.32            | 88.48            | 0.74         |
| valle treponti | 247.3     | VAR-11 | Q 50    | 321.00            | 2.86             | 4.52             | 8.20            | 3.68                | 7.31            | 2.79                | 4.77             | 5.53             | 0.016121            | 4.45              | 72.13             | 64.61            | 1.34         |
| valle treponti | 247.3     | VAR-11 | Q 200   | 404.00            | 2.86             | 4.70             | 8.20            | 3.50                | 7.31            | 2.61                | 4.99             | 5.89             | 0.015855            | 4.84              | 83.39             | 64.61            | 1.36         |
| valle treponti | 247.3     | VAR-11 | Q 500   | 468.00            | 2.86             | 4.86             | 8.20            | 3.34                | 7.31            | 2.45                | 5.15             | 6.13             | 0.014547            | 5.00              | 93.64             | 64.61            | 1.33         |
| valle treponti | 222.1     | VAR-10 | Q 50    | 321.00            | 2.30             | 4.53             | 6.82            | 2.29                | 7.04            | 2.51                | 4.07             | 4.90             | 0.003252            | 2.71              | 118.29            | 65.58            | 0.64         |
| valle treponti | 222.1     | VAR-10 | Q 200   | 404.00            | 2.30             | 4.82             | 6.82            | 2.00                | 7.04            | 2.22                | 4.29             | 5.26             | 0.003147            | 2.94              | 137.59            | 65.58            | 0.65         |
| valle treponti | 222.1     | VAR-10 | Q 500   | 468.00            | 2.30             | 5.04             | 6.82            | 1.78                | 7.04            | 2.00                | 4.46             | 5.52             | 0.003087            | 3.09              | 151.52            | 65.58            | 0.65         |
| valle treponti | 213.3     | VAR-9  | Q 50    | 321.00            | 2.21             | 4.53             | 6.82            | 2.29                | 7.00            | 2.47                | 3.97             | 4.86             | 0.002683            | 2.54              | 126.18            | 66.65            | 0.59         |
| valle treponti | 213.3     | VAR-9  | Q 200   | 404.00            | 2.21             | 4.83             | 6.82            | 1.99                | 7.00            | 2.17                | 4.19             | 5.22             | 0.002642            | 2.77              | 146.02            | 66.65            | 0.60         |
| valle treponti | 213.3     | VAR-9  | Q 500   | 468.00            | 2.21             | 5.05             | 6.82            | 1.77                | 7.00            | 1.95                | 4.35             | 5.48             | 0.002617            | 2.92              | 160.33            | 66.65            | 0.60         |
| valle treponti | 208.3     |        | Q 50    | 321.00            | 2.13             | 4.59             | 6.80            | 2.21                | 6.80            | 2.21                | 3.69             | 4.83             | 0.001553            | 2.15              | 149.58            | 67.30            | 0.46         |
| valle treponti | 208.3     |        | Q 200   | 404.00            | 2.13             | 4.89             | 6.80            | 1.91                | 6.80            | 1.91                | 3.90             | 5.18             | 0.001626            | 2.38              | 169.93            | 67.30            | 0.48         |
| valle treponti | 208.3     |        | Q 500   | 468.00            | 2.13             | 5.11             | 6.80            | 1.69                | 6.80            | 1.69                | 4.06             | 5.44             | 0.001669            | 2.54              | 184.59            | 67.30            | 0.49         |
| valle treponti | 200.3     |        | Bridge  |                   |                  |                  |                 |                     |                 |                     |                  |                  |                     |                   |                   |                  |              |
| valle treponti | 192.3     | VAR-8  | Q 50    | 321.00            | 2.13             | 4.46             | 6.80            | 2.34                | 6.80            | 2.34                | 3.69             | 4.73             | 0.001881            | 2.28              | 141.02            | 67.30            | 0.50         |
| valle treponti | 192.3     | VAR-8  | Q 200   | 404.00            | 2.13             | 4.74             | 6.80            | 2.06                | 6.80            | 2.06                | 3.90             | 5.06             | 0.001997            | 2.53              | 159.50            | 67.30            | 0.53         |
| valle treponti | 192.3     | VAR-8  | Q 500   | 468.00            | 2.13             | 4.93             | 6.80            | 1.87                | 6.80            | 1.87                | 4.06             | 5.31             | 0.002071            | 2.71              | 172.69            | 67.30            | 0.54         |
| valle treponti | 174.8     | VAR-7  | Q 50    | 321.00            | 2.14             | 3.97             | 4.70            | 0.73                | 4.80            | 0.83                | 3.97             | 4.63             | 0.008511            | 3.61              | 88.81             | 66.80            | 1.00         |
| valle treponti | 174.8     | VAR-7  | Q 200   | 404.00            | 2.14             | 4.19             | 4.70            | 0.51                | 4.80            | 0.61                | 4.19             | 4.96             | 0.008159            | 3.90              | 103.51            | 66.80            | 1.00         |
| valle treponti | 174.8     | VAR-7  | Q 500   | 468.00            | 2.14             | 4.35             | 4.70            | 0.35                | 4.80            | 0.45                | 4.35             | 5.20             | 0.007947            | 4.10              | 114.16            | 66.80            | 1.00         |
| valle treponti | 116.0     | VAR-6  | Q 50    | 321.00            | 1.78             | 3.50             | 4.78            | 1.28                | 4.80            | 1.30                | 3.11             | 3.91             | 0.003685            | 2.81              | 114.20            | 66.30            | 0.68         |
| valle treponti | 116.0     | VAR-6  | Q 200   | 404.00            | 1.78             | 3.74             | 4.78            | 1.04                | 4.80            | 1.06                | 3.33             | 4.23             | 0.003803            | 3.10              | 130.22            | 66.30            | 0.71         |
| valle treponti | 116.0     | VAR-6  | Q 500   | 468.00            | 1.78             | 3.92             | 4.78            | 0.86                | 4.80            | 0.88                | 3.49             | 4.47             | 0.003876            | 3.30              | 141.70            | 66.30            | 0.72         |
| valle treponti | 84.8      | VAR-5  | Q 50    | 321.00            | 1.78             | 3.09             | 4.78            | 1.69                | 4.80            | 1.71                | 3.09             | 3.74             | 0.008560            | 3.60              | 89.28             | 68.39            | 1.00         |
| valle treponti | 84.8      | VAR-5  | Q 200   | 404.00            | 1.78             | 3.30             | 4.78            | 1.48                | 4.80            | 1.50                | 3.30             | 4.07             | 0.008197            | 3.88              | 104.08            | 68.40            | 1.00         |
| valle treponti | 84.8      | VAR-5  | Q 500   | 468.00            | 1.78             | 3.46             | 4.78            | 1.32                | 4.80            | 1.34                | 3.46             | 4.31             | 0.007979            | 4.08              | 114.80            | 68.41            | 1.00         |
| valle treponti | 83.7      |        | Q 50    | 321.00            | 1.26             | 2.15             | 7.11            | 4.96                | 7.11            | 4.96                | 2.59             | 3.65             | 0.031661            | 5.41              | 59.34             | 66.35            | 1.83         |
| valle treponti | 83.7      |        | Q 200   | 404.00            | 1.26             | 3.46             | 7.11            | 3.65                | 7.11            | 3.65                | 2.81             | 3.85             | 0.002606            | 2.76              | 146.29            | 66.35            | 0.59         |
| valle treponti | 83.7      |        | Q 500   | 468.00            | 1.26             | 3.69             | 7.11            | 3.42                | 7.11            | 3.42                | 2.97             | 4.12             | 0.002546            | 2.90              | 161.32            | 66.35            | 0.59         |
| valle treponti | 75.0      | VAR-4  | Bridge  |                   |                  |                  |                 |                     |                 |                     |                  |                  |                     |                   |                   |                  |              |
| valle treponti | 66.2      |        | Q 50    | 321.00            | 1.26             | 2.30             | 7.11            | 4.81                | 7.11            | 4.81                | 2.59             | 3.40             | 0.019035            | 4.64              | 69.25             | 66.35            | 1.45         |
| valle treponti | 66.2      |        | Q 200   | 404.00            | 1.26             | 2.48             | 7.11            | 4.64                | 7.11            | 4.64                | 2.81             | 3.75             | 0.018290            | 5.01              | 80.62             | 66.35            | 1.45         |
| valle treponti | 66.2      |        | Q 500   | 468.00            | 1.26             | 2.60             | 7.11            | 4.51                | 7.11            | 4.51                | 2.97             | 4.01             | 0.017828            | 5.27              | 88.86             | 66.35            | 1.45         |

HEC-RAS Plan: 09\_2012 River: Varenna Reach: valle treponti (Continued)

| Reach          | River Sta |       | Profile | Q Total<br>(m3/s) | Min Ch El<br>(m) | W.S. Elev<br>(m) | LOB Elev<br>(m) | L. Freeboard<br>(m) | ROB Elev<br>(m) | R. Freeboard<br>(m) | Crit W.S.<br>(m) | E.G. Elev<br>(m) | E.G. Slope<br>(m/m) | Vel Chnl<br>(m/s) | Flow Area<br>(m2) | Top Width<br>(m) | Froude # Chl |
|----------------|-----------|-------|---------|-------------------|------------------|------------------|-----------------|---------------------|-----------------|---------------------|------------------|------------------|---------------------|-------------------|-------------------|------------------|--------------|
| valle treponti | 59.4      | VAR-3 | Q 50    | 321.00            | 1.18             | 2.18             | 5.25            | 3.07                | 5.25            | 3.07                | 2.47             | 3.27             | 0.019940            | 4.62              | 69.52             | 69.55            | 1.47         |
| valle treponti | 59.4      | VAR-3 | Q 200   | 404.00            | 1.18             | 2.34             | 5.25            | 2.91                | 5.25            | 2.91                | 2.68             | 3.62             | 0.019526            | 5.02              | 80.45             | 69.55            | 1.49         |
| valle treponti | 59.4      | VAR-3 | Q 500   | 468.00            | 1.18             | 2.45             | 5.25            | 2.80                | 5.25            | 2.80                | 2.84             | 3.88             | 0.019401            | 5.31              | 88.15             | 69.55            | 1.51         |
|                |           |       |         |                   |                  |                  |                 |                     |                 |                     |                  |                  |                     |                   |                   |                  |              |
| valle treponti | 25.0      | VAR-2 | Q 50    | 321.00            | 0.83             | 1.85             | 5.59            | 3.74                | 4.20            | 2.35                | 2.01             | 2.65             | 0.014076            | 3.95              | 81.36             | 79.60            | 1.25         |
| valle treponti | 25.0      | VAR-2 | Q 200   | 404.00            | 0.83             | 1.99             | 5.59            | 3.60                | 4.20            | 2.21                | 2.21             | 2.97             | 0.014796            | 4.39              | 92.13             | 79.60            | 1.30         |
| valle treponti | 25.0      | VAR-2 | Q 500   | 468.00            | 0.83             | 2.08             | 5.59            | 3.51                | 4.20            | 2.12                | 2.35             | 3.21             | 0.015362            | 4.70              | 99.59             | 79.60            | 1.34         |
|                |           |       |         |                   |                  |                  |                 |                     |                 |                     |                  |                  |                     |                   |                   |                  |              |
| valle treponti | 0.0       | VAR-1 | Q 50    | 321.00            | 0.58             | 1.45             | 4.00            | 2.55                | 4.82            | 3.37                | 1.63             | 2.22             | 0.016514            | 3.87              | 83.00             | 95.00            | 1.32         |
| valle treponti | 0.0       | VAR-1 | Q 200   | 404.00            | 0.58             | 1.56             | 4.00            | 2.44                | 4.82            | 3.26                | 1.80             | 2.52             | 0.017988            | 4.35              | 92.95             | 95.00            | 1.40         |
| valle treponti | 0.0       | VAR-1 | Q 500   | 468.00            | 0.58             | 1.64             | 4.00            | 2.36                | 4.82            | 3.18                | 1.93             | 2.74             | 0.018646            | 4.66              | 100.50            | 95.00            | 1.45         |